Niagara Falls, New York
July 13, 1983

Design Memo No. 1

File No. 11309

SUBJECT: Radiological Survey, Cleanup Options and Cost Estimates

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UNION CARBIDE

INTERNAL CORRESPONDENCE

METALS DIVISION

P O BOX 97, NIAGARA FALLS, NEW YORK 14302

To (Name) Mr. R. J. Klotzbach
Division UCC-Metals Division
Location Niagara Falls, NY

Date July 13, 1983
Originating Dept Engineering Department
Answering letter date

Copy to See Attached Distribution

Subject Design Memo No. 1
Radiological Survey, Cleanup
Options and Cost Estimates
File No. 11309

Dear Bob:

Attached is Design Memo No. 1 "Radiological Survey, Cleanup Options and Cost Estimates".

Union Carbide Corporation presently is out of compliance with its New York Radioactive Materials License No. 950-0139 due to radioactive source concentrations in excess of 500 ppm behind Niagara Building 166, where access to employees is unrestricted. To identify the area and depth of contamination, the area south of Building 166 was surveyed by Mr. D. R. Brosnahan and the author. The results indicate that a soil volume of 5130 $ft.^3$ must be restricted or removed for compliance with New York State regulations. An additional 1700 $ft.^3$ must be removed for delicensing and unrestricted use.

The following five alternatives have been considered and cost estimates prepared as part of the design memo.

Alternative	Description	Cost
1	Fence in Place	$ 10,000
2	Remove & Fence on Elkem Property	65,000
3	Remove & Fence on UCC Property	120,000
4	Remove & Bury - UCC Niagara	175,000
5	Remove & Ship to a Repository	335,000

The recommendation is to proceed with Alternative No. 3, based primarily on the condition that the property will be deeded to Elkem Metals Company. The material remains available for implementing Alternative No. 4, "Bury on UCC Property", or Alternative No. 5, "Ship to an Approved Repository", in the future. An R & D effort can also proceed to investigate ways to reduce the volume. Far less expense is required for the alternative to "Fence in Place", which is recommended if property ownership does not change.

L. G. Evans

LGE/dac
Attachments

Union Carbide Corporation
Metals Division
Technology Department - Engineering
Niagara Falls, New York

File No. 11309

DESIGN MEMORANDUM
SPONSOR: T. J. KAGETSU

PROJECT: Soil Decontamination - South of Building 166, Niagara

BY: L. G. Evans/D. R. Brosnahan

DATE: May 20, 1983

Design Memo No. 1
Revision 0
Subject: Radiological Survey, Cleanup Options and Cost Estimates

1.0 INTRODUCTION

1.1 Scope

To include an engineering evaluation of the alternatives available for disposal of the radioactive contaminants from areas south of Building 166.

1.2 History

The U. S. Department of Energy performed surveys in 1976 to assess the radiological status of facilities utilized under Manhattan Engineer District contract during the period 1943-1946. UCC's Metals Division at Niagara was one of those sites. They discovered contamination South of Building 166 and notified Union Carbide and New York State.

As a result, New York State Department of Labor performed a follow up survey on December 1, 1981 and cited UCC for violation of its New York Radioactive Materials License No. 950-0139 by storing source concentrations in excess of 500 ppm without restricting access to employees.

Later, thorium was found to be a major radioactive contaminate indicating that the radiation is unrelated to the Manhattan Engineer Project.

This problem is further complicated by the divestiture of the ferroalloys business and anticipated eventual ownership of the property by Elkem Metals Company.—

2.0 DISCUSSION

2.1 General

All phases of a waste clean up project are directly affected by the quantity of waste to be handled. Therefore, the first priority was to develop a reasonably good estimate of the volume.

A gamma radiation survey was performed over the entire fenced area behind Building 166 to determine the area of involvement excluding areas covered by asphalt or concrete. Soil samples were obtained from several areas and analyzed for % U_3O_8 and % ThO_2. Samples were extracted at various levels in five holes to determine depth of involvement. Samples were also taken to obtain a rough correlation between gamma readings and uranium/thorium content.

2.2 Cleanup Criteria

2.2.1 General

The cleanup criteria is dependent upon the use or future use of the property. New York State Regulations would apply with continuance of license. NRC Regulations would apply for delicensing.

2.2.2 New York State Regulations

NYS requires restriction of access to areas where the radioactive contaminants exceed 500 ppm of source materials. Below 500 ppm radioactive materials can be stored with unrestricted access.

To facilitate a comparison of this limit to the NRC limits a conversion to pCi/gm is made assuming a 2:1 (thorium:uranium) ratio. (See calculations attached).

These limits for unrestricted access are the total of the following:

≤36 pCi/gm Thorium
≤57 pCi/gm Uranium

These limits are used only for determination of compliance with our license for restricted or unrestricted access.

If the State is approached by UCC for criteria for delicensing they probably will require compliance with NRC Regulations due to Agreement State principles.

2.2.3 NRC Regulations

The NRC proposed regulations[1] provide four options for burial and delicensing. A fifth option deals with continuing the license.

(1) Federal Register/Vol. 46 No. 205/Friday Oct. 23, 1981, Notices (attached).

Option 1 ≤10 pCi/gm Thorium and/or 10 pCi/gm Uranium - unrestricted use and delicensing. (Burial not required).

Option 2&3 ≤50 pCi/gm Thorium and 40 pCi/gm Uranium - deed amendment and delicense, restricted access by burial with minimum four foot cover. No residential building. Option 2 specifies thorium and Option 3 uranium.

Option 4 ≤500 pCi/gm Thorium and 200 pCi/gm Uranium - much more restricted use of the land than Options 2 and 3. No excavation or building.

Option 5 of the Regulation deals with on-site storage of higher concentrations pending the availability of space at an approved repository. No burial is permitted.

2.3 Radiological Survey

2.3.1 Gamma Survey

The survey was performed with a portable gamma ray spectrometer, Model GR-410 manufactured by Geometries Exploranium and detector Model No. GPX-21 employing a sodium iodide thallium activated crystal as a scintillation phosphor.

All of the area south of Building 166 and bounded by the chain link fence was surveyed except areas covered by concrete or asphalt. The actual area surveyed was approximately 26,000 ft.^{2}. Concrete and asphalt cover 63,000 ft.^{2}.

A 10' x 10' grid was established and readings were taken at the intersection points. Extra readings were taken along the west track center line and near the edge of the concrete on both sides.

A resurvey of a 400 ft.^{2} area was done using a 2' x 2' grid to assess the reliability of the general survey. The location of this area is shown on Drawing SF-7902 as Detail 1. The data are also displayed in Figure I (attached).

All gamma meter readings were reduced to the number of times background and are reported on Drawing SF-7902.

2.3.2 Analytical Survey

Soil Samples - The physical samples were essentially 'grab' samples. No systematic sampling technique was used. The analytical work was performed by Elkem's laboratory at Niagara Falls. The results are shown in Table III (attached) and on Drawing SF-7902.

The chemical analyses of the surface soil samples ranged from 0.006% to 0.40% ThO_2 and from 0.002% to 0.17% U_3O_8.

2.4 Survey vs Regulations

The following Table I is a comparison of the surface soil sample analyses converted to pCi/g and the gamma radiation readings (times background). Below the table is a guide comparing gamma readings to cleanup or storage criteria. The gamma range is estimated based on the analyses of Table III (attached).

TABLE I

GAMMA X BKG	URANIUM pCi/gm	THORIUM pCi/gm	SAMPLE NO.	CONTAMINANTS PPM
1	3	2	11	20
3	11	11	9	131
5	6	6	8	70
6	11	19	2	210
8	8	22	5	228
9	14	40	1	401
12	26	61	3	650
13	8	12	10	140
17	26	66	4	674
21	42	105	12	1094
26	57	164	14	1664
33	82	201	13	2091
83	466	382	5	4957

GAMMA RANGE	NYS/NRC REQUIREMENTS
1 - 5	Will meet NRC proposed regulations for delicensing and unrestricted land use. NRC Option 1 (Sec. 2.3.3) - no burial required.
6 - 9	NYS allows unrestricted access and continue license. NRC allows burial and delicensing. Options 2 and 3 - burial required.
10 - 60*	NYS requires restricted access. NRC allows burial and delicensing - Option 4.
>60	NYS requires restricted access. NRC requires restricted access and storage until space is available at an approved repository, e.g., Barnwell, SC.

*Interpolated

2.5 Contamination Volume

2.5.1 General

The gamma survey, surface and subsurface soil analyses and the guide above are combined to estimate the quantity of material of each class in each area.

The depth of contamination varies throughout the area of involvement, but is generally less than six inches. However, to expedite cleanup, the rails and ties must be removed, requiring a minimum removal depth of eight inches.

2.5.2 High Concentration Area

This area contains material which exceeds NRC burial limits and must be disposed of (eventually) at an approved repository. Gamma readings are above 60 times background. This area is the most heavily contaminated both in radiation level and depth of contamination. Contamination can be found 12 inches below the surface.

Volume = 400 $ft.^2$ x 1 ft. deep = 400 $ft.^3$

2.5.3 Medium Concentration Area

This area contains material which requires restricted access. Gamma readings are 10-60 times background.

Volume = 6400 $ft.^2$ x 2/3 ft. deep = 4267 $ft.^{3*}$

*Approximately 30% of the area found to be low concentration on the general survey (10' x 10' Grid) was found to be medium concentration upon resurvey (2' x 2' Grid). See Drawing SF-7902 or Figure I. This volume is included.

2.5.4 Low Concentration Area

This area contains material which must be removed to delicense but which can remain with unrestricted access under current license. Gamma readings are 6-9 times background.

Volume = 2200 $ft.^2$ x 2/3 ft. deep = 1467 $ft.^3$

2.5.5 Summary

The following summarizes the above volumes including a 15 percent contingency:

High Concentration	- 230 $ft.^3$
Medium Concentration	- 4900 $ft.^3$
Low Concentration	- 1700 $ft.^3$
TOTAL	6830 $ft.^3$

NOTE: No exploration was done beneath any of the concrete or asphalt pads. The depth of involvement and the location of contamination along the railroad tracks indicates the radioactive materials were spilled during handling from rail cars and contamination under the pads is unlikely.

3.0 DESCRIPTION OF CLEANUP ALTERNATIVES

3.1 Summary

Five cleanup alternatives are considered in this memorandum. The major factors influencing final selection of an alternative are: term of solution (short or long), delicensing, property transfer to Elkem, compliance with NYS Regulations, and cost.

Table II below summarizes the alternatives opposite these factors.

TABLE II

ALTER-NATIVE NO.	DESCRIPTION	TERM	DELICENSE*	TRANSFER PROPERTY TO ELKEM	COST $000
1	Fence in place	Short	No	No	10
2	Remove & fence on Elkem Property	Short	No	No	65
3	Remove & fence on UCC Property	Medium	No	Yes	120**
4	Remove & bury - UCC Niagara	Long	Yes	Yes	175
5	Remove & ship to repository	Permanent	Yes	Yes	335

* Assumes that this is the only contaminated area in the plant.

**If a concrete pad is available the cost would be $90,000.

3.2 Alternative No. 1 - Fence in Place

Simply enclose the contaminated area thus restricting access.

Requirements - 400 feet of fence.

Advantages - Quick solution to come into compliance with NYS.
- Minimum cost.

Disadvantages - Contamination remains requiring future action.
- Transfer of property to Elkem is not possible unless Elkem obtains a license or UCC removes the material.

3.3 Alternative No. 2 - Remove and Fence on Elkem Property

As mentioned earlier, much of the area South of Building 166 is covered with concrete and asphalt. The material (soil) could be removed and stored on an existing pad in the Southeast corner of the property. The pad and a plastic covering would provide stability and a fence would provide restricted access until final disposal.

Requirements
- Removal of railroad tracks.
- Disposal of scrap and debris**.
- 100 ft. fence required - S & E corner site.
- Concrete/asphalt pad - already available.
- Replacement of railroad track.

Advantages
- Consolidation of contaminants.
- Access can be restricted.
- This work is required for ultimate disposal in any event.

Disadvantages
- Short term solution.
- 1/10 acres of land would not be available for Elkem use.
- Transfer of property to Elkem is not possible unless Elkem obtains a license or UCC removes the material.

**This includes
- Three flat-bed railroad cars loaded with induction furnaces.
- Stacks of deteriorating 55 gallon drums.
- Stacked wooden boxes containing steel shot, etc.
- Numerous 5' x 5' x 5' steel boxes.
- Various ladles, furnaces, carbon electrodes, etc.

3.4 Alternative No. 3 - Remove and Fence on UCC Property

The work required here is essentially the same as in 3.3 above. Costs increase and extra care must be taken to avoid contamination of other areas of the plant. However, the property can then be released for transfer to Elkem. An area in the Niagara Plant has been designated by plant personnel for possible use.

Requirement
- Same as 3.3 except more fence and a new concrete pad may be required.

Advantage
- Same as 3.3 except it has the additional advantage of not interfering with Elkem property use. Property can be transferred to Elkem.

Disadvantage
- Medium term solution.

3.5 Alternative No. 4 - Remove and Bury - UCC Niagara

Burial on Union Carbide owned property was explored for the Marietta TaCb cleanup project. The main problems are: finding a suitable burial site, getting State and Local approval, future use or transfer of the burial site is restricted, and long term monitoring of the site is necessary.

Requirements
- Remove and replace railroad tracks.
- Dispose of scrap and debris at approved repository.
- A suitable burial site.
- Containers (55 gallon drums) may be required.
- Dispose of 400 $ft.^3$ soil at approved repository.

Advantages
- Long term solution.
- Delicense.

Disadvantages
- Use of the burial site will be restricted - no construction.

3.6 Alternative No. 5 - Remove and Ship to Repository

This alternative is permanent. Once the material is received at the repository, the host state becomes owner and the licensee's accountability ends. However, this is the most expensive alternative.

Requirements
- Remove and replace railroad tracks.
- Disposal of scrap and debris at approved repository.
- Containers.
- Loading system.

Advantage
- Permanent solution.

Disadvantage
- Highest cost.

3.7 Remove and Ship to Uravan

This alternative was selected for the TaCb residue cleanup project in Marietta. The uranium content of the TaCb residue was 0.13% U_3O_8 and processing to recover uranium values was feasible and acceptable to the Colorado Department of Health. The material (soil) analyses at Niagara indicate 0.01% U_3O_8. Therefore, transfer to Uravan cannot be considered.

4.0 COST ESTIMATES

As discussed in Section 2.4, the radiological survey indicates three levels of contamination above NRC delicensing limits. They are: 6-9 x BKG (background), 10-60 x BKG and greater than 60 x BKG. Volumes were calculated

for each area with the thought that some alternatives would not require the removal of the combined total volume but only those areas with the highest concentrations. However, to simplify costings and cost comparison, only the total volume of Section 2.5.5 is considered. All medium and high concentration material requires fencing or removal. The low concentration material adds an additional 25% to the volume, but adds only 10% to the cost. The volume for cost estimating is then 6830 ft.^{3}.

Cost Estimates No. 6342 through 6346 are attached.

Cost Estimate No. 6342	Fence in Place	$ 10,000
Cost Estimate No. 6343	Remove and Fence - Elkem	$ 65,000
Cost Estimate No. 6344	Remove and Fence - UCC Niagara	$120,000
Cost Estimate No. 6345	Remove and Bury - UCC Niagara	$175,000
Cost Estimate No. 6346	Remove and Ship to Barnwell	$335,000

Note: Costs do not reflect removal of debris which is assumed to be Elkem's accountability.

5.0 RECOMMENDATIONS

Removal and relocation of the contaminated soil to the Niagara plant as described in Alternative No. 3 is recommended based on the following:

1. The property will be deeded to Elkem Metals Company.

2. Any restriction to the use of the property behind Building 166, or any potential cleanup liability to Elkem, is unacceptable.

3. EPA and NRC regulatory uncertainties exist concerning burial. (Perpetual maintenance costs are not included in the estimate for Alternative No. 4.) Burial also makes the material unavailable for disposal at an approved repository as discussed below. New York state may ban all burial within the state in the near future.

4. Disposal at Barnwell, SC is too costly and there is reason to believe that a new repository will be opened in the Northeast by 1986 which may reduce the cost of that option.

Any remedial effort must be approved by the State of New York, Department of Labor. For the material to be left on-site, Radioactive Materials License No. 950-0139 must be amended. This amendment or some form of approval should be received prior to the beginning of any cleanup.

Niagara Falls, New York
May 19, 1983

Cost Estimate No. 6342

File No. 11309

Revised: July 6, 1983

UNION CARBIDE CORPORATION
METALS DIVISION
TECHNOLOGY DEPARTMENT - ENGINEERING
SPONSOR: T. J. KAGETSU

FEASIBILITY STUDY COST ESTIMATE
DECONTAMINATION BUILDING 166 - FENCE IN PLACE (ALTERNATIVE 1)

	1983 DOLLARS	MATERIAL $000	LABOR $000	CAPITAL $000	NON-CAPITAL $000
100	MATERIAL				
101	400' Fence (6 ft.) Along 1100N	-	8	8	-
	TOTAL		8	8	-
	TOTAL DIRECTS		8	8	-
	ENGINEERING			-	-
	CONTINGENCY			2	
	RADIOLOGIST/HEALTH PHYSICS (1 Mo.)			-	-
	TOTAL			10	-

FRANGELORI/dac

cc: TJK(2): CGR: AJC: LGE: RGH: FRA(4)

Niagara Falls, New York
May 19, 1983

Cost Estimate No. 6343

File No. 11309

Revised: July 6, 1983

UNION CARBIDE CORPORATION
METALS DIVISION
TECHNOLOGY DEPARTMENT - ENGINEERING
SPONSOR: T. J. KAGETSU

FEASIBILITY STUDY COST ESTIMATE
DECONTAMINATION BUILDING 166 - REMOVE AND FENCE ELKEM (ALTERNATIVE 2)

	1983 DOLLARS	MATERIAL $000	LABOR $000	CAPITAL $000	NON-CAPITAL $000
100	SOIL REMOVAL				
101	Remove & Relocate Soil 7000 ft.^{3}	-	5	-	5
102	Fence 6 ft. - 100 ft.	-	2	-	2
	TOTAL		7		7
200	RECLAMATION				
201	Backfill	-	5	5	-
202	Equipment Decontamination (Loader & Trucks)	-	3	3	-
203	Replace RR Track	-	25	15	10
	TOTAL		33	23	10
	TOTAL DIRECTS		40	23	17
	ENGINEERING			7	5
	CONTINGENCY			8	3
	RADIOLOGIST/HEALTH PHYSICS			2	-
	TOTAL			40	25

FRANGELORI/dac
cc: TJK(2): CGR: AJC: LGE: RGH: FRA(4)

Niagara Falls, New York
May 19, 1983

Cost Estimate No. 6344

File No. 11309

Revised: July 6, 1983

UNION CARBIDE CORPORATION
METALS DIVISION
TECHNOLOGY DEPARTMENT - ENGINEERING
SPONSOR: T. J. KAGETSU

•FEASIBILITY STUDY COST ESTIMATE•
DECONTAMINATION BUILDING 166 - REMOVE AND FENCE - UCC NIAGARA (ALTERNATIVE 3)

	1983 DOLLARS	MATERIAL $000	LABOR $000	CAPITAL $000	NON-CAPITAL $000
100	SOIL REMOVAL				
101	Remove & Relocate Soil 7000 ft.^{3} (haul)	-	10	-	10 ✓
102	Concrete Pad - 60 cy.	-	30	30 ✓	-
103	Fence 6 ft. - 200 ft.	-	4	4 ✓	-
	TOTAL		44	34	10
200	RECLAMATION				
201	Backfill	-	5	5 ✓	-
202	Equipment Decontamination (Loader & Trucks)	-	3	3 ✓	-
203	Replace RR Track	-	25	15 ✓	10 ✓
	TOTAL		33	23	-
	TOTAL DIRECTS		77	57	20
	ENGINEERING			9	6
	CONTINGENCY			10	2
	RADIOLOGIST/HEALTH PHYSICS (1 Mo.)			14	2
	TOTAL			90	30

FRANGELORI/dac
cc: TJK(2): CGR: AJC: LGE: RGH: FRA(4)

Niagara Falls, New York
May 19, 1983

Cost Estimate No. 6345

File No. 11309

Revised: July 6, 1983

UNION CARBIDE CORPORATION
METALS DIVISION
TECHNOLOGY DEPARTMENT - ENGINEERING
SPONSOR: T. J. KAGETSU

FEASIBILITY STUDY COST ESTIMATE
DECONTAMINATION BUILDING 166 - REMOVE AND BURY - UCC NIAGARA (ALTERNATIVE 4)

	1983 DOLLARS	MATERIAL $000	LABOR $000	CAPITAL $000	NON-CAPITAL $000
100	SOIL REMOVAL				
101	Remove & Relocate Soil 7000 ft.^{3} (haul)	-	10	-	10
102	Clay Lined Pit w/Drain System 40 ft.^{2} x 5 ft.	-	15	15	-
103	Clay Cap	-	15	15	-
	TOTAL		40	30	10
200	RECLAMATION				
201	Backfill	-	5	5	-
202	Equipment Decontamination (Loader & Trucks)	-	3	3	-
203	Replace RR Track	-	25	15	10
	TOTAL		33	23	10
300	DISPOSAL				
301	Transportation	-	1	-	1
302	Burial Fee (200 ft.^{3})	1	8	-	9
	TOTAL	1	9		10
	TOTAL DIRECTS	1	82	53	30
	ENGINEERING			8	8
	CONTINGENCY			15	5
	RADIOLOGIST/HEALTH PHYSICS (1 Mo.)			4	2
	SITE SELECTION			35	
	TOTAL			125	50

FRANGELORI/dac
cc: TJK(2): CGR: AJC: LGE: RGH: FRA(4)

Niagara Falls, New York
May 19, 1983

Cost Estimate No. 6346

File No. 11309

Revised: July 6, 1983

UNION CARBIDE CORPORATION
METALS DIVISION
TECHNOLOGY DEPARTMENT - ENGINEERING
SPONSOR: T. J. KAGETSU

FEASIBILITY STUDY COST ESTIMATE
DECONTAMINATION BUILDING 166 - REMOVE AND SHIP TO BARNWELL, SC (ALTERNATIVE 5)

	1983 DOLLARS	MATERIAL $000	LABOR $000	CAPITAL $000	NON-CAPITAL $000
100	SOIL REMOVAL				
101	Remove Soil 7000 ft.^{3} (haul)	-	5	-	5
102	Containers (80 boxes - 100 ft.^{3})	20	-	-	20 ✓
103	Loading Trucks (incl. Pallets, etc.)	5	4	-	9 ✓
	TOTAL	25	9		34
200	RECLAMATION				
201	Backfill	-	5	5 ✓	-
202	Equipment Decontamination (Loader & Trucks)	-	3	3 ✓	-
203	Replace RR Track	-	25	15 ✓	10 ✓
	TOTAL		33	23	10
300	DISPOSAL				
301	Transportation 1000_3$ (10 loads)	-	10	-	10
302	Burial Fee (8000 ft.^{3} incl Container)	-	160	-	160
	TOTAL		170		170
	TOTAL DIRECTS	25	212	23	214
	ENGINEERING			5	28
	CONTINGENCY			3	46
	RADIOLOGIST/HEALTH PHYSICS (1 Mo.)			4	2
	TOTAL			45	290

FRANGELORI/dac
cc: TJK(2): CGR: AJC: LGE: RGH: FRA(4)

CALCULATIONS

New York State regulations require that access be restricted to areas where the source material exceeds 500 ppm. For the purpose of comparison with NRC regulations a Thorium/Uranium ratio of 2:1 is assumed.

Therefore, the maximum activities for unrestricted access are:

NYS maximum Thorium activity equals:

$$330 \text{ parts/million} \times 1.09 \times 10^5 \text{ pCi/gm} = 36 \text{ pCi/gm}$$

NYS maximum Uranium activity equals:

$$170 \text{ parts/million} \times 3.33 \times 10^5 \text{ pCi/gm} = 57 \text{ pCi/gm}$$

The Assistant Secretary finds that good cause exists for not publishing the supplement to the Puerto Rico State Plan as a proposed change and making the Regional Administrator's approval effective upon publication for the following reasons:

1. The standards are identical to the Federal standards which were promulgated in accordance with Federal law meeting requirements for public participation.

2. The standards were adopted in accordance with the procedural requirement of State Law and further participation would be unnecessary.

The decision is effective October 23, 1981.

(Sec. 18 Pub L. 91-596, 84 Stat. 1608 (29 U.S.C. 667))

Signed at New York City, New York, this 15th day of June 1981.

Roger A. Clark,

Regional Administrator.

[FR Doc. 81-30745 Filed 10-22-81 8:45 am]

BILLING CODE 4510-26-M

NUCLEAR REGULATORY COMMISSION

Advisory Committee on Reactor Safeguards, Subcommittee on Callaway Plant; Location Change

The ACRS Subcommittee on Callaway Plant will hold a meeting on November 4 and 5, 1981, at the HOLIDAY INN-WEST, 1900 I-70 Drive Southwest, Columbia, MO instead of the Hilton Inn.

Notice of this meeting was published in the Federal Register on October 19, 1981 (46 FR 51329), and all other items remain the same except for the location change as indicated above.

Dated: October 19, 1981.

John C. Hoyle,

Advisory Committee, Management Officer.

[FR Doc. 81-30733 Filed 10-22-81 8:45 am]

BILLING CODE 7590-01-M

Disposal or Onsite Storage of Thorium or Uranium Wastes From Past Operations

AGENCY: Nuclear Regulatory Commission (NRC).

ACTION: Discussion of options for NRC approval of applications for disposal or onsite storage of thorium or uranium wastes; interim use and public comment.

SUMMARY: This notice discusses five options for NRC approval of disposal or onsite storage or thorium or uranium wastes from past nuclear operations. The options are contained in a Branch Technical Position for administration by the Uranium Fuel Licensing Branch, Division of Fuel Cycle and Material Safety, Office of Nuclear Material Safety and Safeguards.

DATES: Comments on the options for disposal or onsite storage of thorium or uranium are encouraged. Such comments will be considered in any subsequent revision of the Branch Technical Position. Comments are due December 22, 1981.

Note.—Comments received after the expiration date will be considered if it is practical to do so, but assurance of consideration cannot be given except as to comments filed on or before that date.

FOR FURTHER INFORMATION CONTACT: Ralph G. Page, Chief, Uranium Fuel Licensing Branch, Division of Fuel Cycle and Material Safety, Office of Nuclear Material Safety and Safeguards, Washington, D.C. 20555, telephone 301-427-4309.

SUPPLEMENTARY INFORMATION:

I. Introduction

Some of the sites formerly used for processing thorium and uranium are known today to be contaminated with residual radioactive materials. Some are currently covered by NRC licenses. Others were once licensed, but the licenses to possess and use material have expired. In many cases, the total amount of contaminated soil is large, but the activity concentrations of radioactive materials are believed sufficiently low to justify their disposal on privately owned lands or storage onsite rather than their transport to a licensed radioactive materials disposal (commercial) site. In many instances packaging and transporting these wastes to a licensed disposal site would be too costly and not justified from the standpoints of risk to the public health or cost-benefit. Furthermore, because of the total volume of these wastes, limited commercial waste disposal capacity, and restrictions placed on receipt of long-lived wastes at commercial sites, it is not presently feasible to dispose of these wastes at commercial low-level waste disposal sites.

Effective January 28, 1981, NRC regulations in 10 CFR 20, "Standards for Protection Against Radiation", were amended (45 FR 71761-71762) to delete § 20.304 which provided general authority for disposal of radioactive materials by burial in soil. Under the amended regulations, licensees must apply for and obtain specific NRC approval to dispose of radioactive materials in this manner under the provisions of 10 CFR 20.302. A case-by-case review was believed needed to assure that burial of radioactive wastes would not present an unreasonable health hazard at some future date.

The deleted provisions of § 20.304 previously permitted burial of up to 100 millicuries of thorium or natural uranium at any one time, with a yearly limitation of 12 burials for each type of material at each site. The only disposal standards specified were (1) burial at a minimum depth of four feet, and (2) successive burials separated by at least six feet. Thus a total of 1.2 curies of these materials were permitted to be disposed of each year by burial in a 12 foot by 18 foot or larger plot of ground.

Under the amended regulations, it is incumbent on an applicant who wants to bury radioactive wastes to demonstrate that local land burial is preferable to other disposal alternatives. The evaluation of the application takes into account the following information:

Types and quantities of material to be buried
Packaging of waste
Burial location
Characteristics of burial site
Depth of burial
Access restrictions to disposal site
Radiation safety procedures during disposal operations
Recordkeeping
Local burial restrictions, if any

For applications involving disposal of soils contaminated with low level concentrations of thorium and uranium (other than concentrations not exceeding EPA cleanup standards), the matters of principal importance are:

Concentrations of thorium and uranium (either in secular equilibrium with their daughters or without daughters present)
Volume of contaminated soil
Costs for offsite and onsite disposal
Availability of offsite burial space
Disposal site characteristics
Depth of burial and accessibility of buried wastes
State and local government views

II. Branch Technical Position

There are five acceptable options for disposal or onsite storage of thorium and uranium contaminated wastes. Applications for disposal or storage will be approved if the guidelines discussed under any option are met. Applications for other methods of disposal may be submitted and these will be evaluated on their own merits.

1. Disposal of acceptably low concentrations (which meet EPA cleanup standards) of natural thorium with daughters in secular equilibrium, depleted or enriched uranium, and

uranium ores with daughters in secular equilibrium with no restriction on burial me[illegible]

[illegible] this option, the concentrations of natural thorium and depleted or enriched uranium wastes are set sufficiently low that no member of the public is expected to receive a radiation dose commitment from the disposed materials in excess of 1 millirad per year to the lung or 3 millirads per year to the bone from inhalation and ingestion, under any foreseeable use of the material or property. These radiation dose guidelines were recommened by the Environmental Protection Agency (EPA) for protection against transuranium elements present in the environment as a result of unplanned contamination (42 FR 60956–60959). In addition, the concentrations are sufficiently low so that no individual may receive an external dose in excess of 10 microroentgens per hour above background. This is compatible with guidelines EPA proposed as cleanup standards for inactive uranium processing sites (46 FR 2556–2563).

For natural uranium ores having daughters in equilibrium, the concentration limit is equal to that set by the EPA (46 FR 2556–2563) for radium-226 (i.e., 5 pCi/gm, including ba[illegible]ound) and its decay products. [illegible] concentrations specified below are believed appropriate to apply. It is expected, however, that currently licensed operations will be conducted in such a manner as to minimize the possibility of soil contamination and when such occurs the contamination will be reduced to levels as low as reasonably achievable.

Kind of material	Concentration (pCi/gm)
Natural thorium (Th-232 plus Th-228) if all daughters are present and in equilibrium	10
Depleted Uranium	35
Enriched Uranium	30
Natural Uranium Ores (U-238 plus U-234) if all daughters are present and in equilibrium	10

The analysis upon which the Branch Technical Position is based is available for inspection at the Commission's Public Document Room at 1717 H St., N.W., Washington, D.C.

The concentrations specified under this option may be compared with naturally occurring thorium and uranium ore concentrations of 1.3 pCi/gm in ig[illegible]ous rock and uranium [illegible]ntrations of 120 pCi/gm in Florida phosphate rock and 50–80 pCi/gm in Tennessee bituminous shale Concentration limits for natural thorium and natural uranium ore wastes containing daughters not at secular equilibrium can be calculated on a case-by-case basis using the applicable isotopic activities data.

2. Disposal of certain low concentrations of natural thorium with daughters in secular equilibrium and depleted or enriched uranium with no daughters present when buried under prescribed conditions with no subsequent land use restrictions and no continuing NRC licensing of the material.

Under this option the concentrations of natural thorium and uranium are set sufficiently low so that no member of the public will receive a radiation dose exceeding those discussed under option 1 when the wastes are buried in an approved manner absent intrusion into the burial grounds. This option will require establishing prescribed conditions for disposal in the license, such as depth and distribution of material, to minimize the likelihood of intrusion. Burial will be permitted only if it can be demonstrated that the buried materials will be stabilized in place and not be transported away from the site.

Acceptability of the site for disposal will depend on topographical, geological, hydrological and meteorological characteristics of the site. At a minimum, burial depth will be at least four feet below the surface. In the event that there is an intrusion into the burial ground, no member of the public will likely receive a dose in excess fo 170 millirems to a critical organ. An average dose not exceeding 170 millirems to the whole body for all members of a general population is recommended by international and national radiation expert bodies to limit population doses With respect to limiting doses to individual body organs, the concentrations are sufficiently low that no individual will receive a dose in excess of 170 millirems to any organ from exposure to natural thorium, depleted uranium or enriched uranium.

The average activity concentration of radioactive material that may be buried under this option in the case of natural thorium (Th-232 plus Th-228) is 50 pCi/gm, if all daughters are present and in equilibrium; for enriched uranium it is 100 pCi/gm if the uranium is soluble and 250 pCi/gm if insoluble; for depleted uranium it is 100 pCi/gm if the uranium is soluble and 300 pCi/gm if insoluble. Natural uranium ores containing radium 226 and its daughters are not included under this option, because of possible radon 222 emanations and resultant higher than acceptable exposure of individuals in private residences if houses were built over buried materials.

3. Disposal of low concentrations of natural uranium ores, with all daughters in equilibrium, when buried under prescribed conditions in areas zoned for industrial use and the recorded title documents are amended to state that the specified land contains buried radioactive materials and are conditioned in a manner acceptable under state law to impose a covenant running with the land that the specified land may not be used for residential building. (There is no continuing NRC licensing of the material.)

Disposal will be approved if the burial criteria outlined in option 2 (including burial at a minimum of 4 feet) are met. Depending upon local soil characteristics, burials at depths greater than 4 feet may be required. In order to assure protection against radon 222 releases (daughter in decay chain of uranium 238 and uranium 234), it is necessary that the recorded title documents be amended to state in the permanent land records that no residential building should be permitted over specified areas of land where natural uranium ore residues (U-238 plus U-234) in concentrations exceeding 10 pCi/gm has been buried. Industrial building is acceptable so long as the concentration of buried material does not exceed 40 pCi/gm of uranium (i.e., Ra-226 shall not exceed 20 pCi/gm).

4. Disposal of land-use-limited concentrations of natural thorium or natural uranium with daughters in secular equilibrium and depleted or enriched uranium without daughters present when buried under prescribed conditions in areas zoned for industrial use and the recorded title documents are amended to state that the land contains buried radioactive material and are conditioned in a manner acceptable under state law to impose a covenant running with land that the land (1) may not be excavated below stated depths in specified areas of land unless cleared by appropriate health authorities, (2) may not be used for residential or industrial structures over specified areas where radioactive materials in concentrations higher than specified in options 2 and 3 are buried, and (3) may not be used for agricultural purposes in the specified areas. (There is no continuing NRC licensing of the disposal site.)

Under this option, conditions of burial will be such that no member of the public will receive radiation doses in excess of those discussed under option 1 absent intrusion into the burial ground Criteria for disposal under these conditions is predicated upon the assumption that intentional intrusion is less likely to occur if a warning is given

in land documents of record not to excavate below burial depths in specified areas of land without clearance by health authorities; not to construct residential or industrial building on the site; and not to use specified areas of land for agricultural purposes. Because of this, we believe it appropriate to apply a maximum critical organ exposure limit of 500 millirems per year to thorium and uranium buried under this restriction instead of 170 millirems as used in options 2 and 3. In addition, any exposure to such materials is likely to be more transient than assumed (essentially continual exposure) under those options. These two factors combine to increase the activity concentration limits calculated under option 2 by about 10. Thus, the average concentration that may be buried under this option for thorium (Th-232 plus Th-228) is 500 pCi/gm if all daughters are present and in equilibrium, for enriched uranium it is 1000 pCi/gm if the uranium is soluble and 2500 pCi/gm if insoluble, and for depleted uranium it is 1000 pCi/gm if the uranium is soluble and 3000 pCi/gm if insoluble.

With respect to natural uranium with daughters present and in equilibrium, the concentration that may be buried under this option is 200 pCi/gm of U-238 plus U-234, i.e., 100 pCi/gm Ra-226. This concentration is based on a limited exposure of 2.4 hours per day to limit the radon dose to less than 0.5 working level month (WLM) which is equivalent to continuous exposure to 0.02 working level (WL). Depending upon local soil characteristics, burials at depths greater than 4 feet may be required.

SUMMARY OF MAXIMUM CONCENTRATIONS PERMITTED UNDER DISPOSAL OPTIONS

Kind of Material	Disposal Options			
	1[1]	2[2]	3[3]	4[4]
Natural Thorium (Th-232 + Th-228) with daughters present and in equilibrium	10	50		500
Natural Uranium (U-238 + U-234) with daughters present and in equilibrium	10		40	200
Depleted Uranium:				
*Soluble	35	100		1,000
*Insoluble	35	300		3,000
Enriched Uranium:				
*Soluble	30	100		1,000
*Insoluble	30	250		2,500

[1] Based on EPA cleanup standards.
[2] Concentrations based on limiting individual doses to 170 mrem/yr.
[3] Concentration based on limiting equivalent exposure to 0.02 working level or less.
[4] Concentrations based on limiting individual doses to 500 mrem/yr and in case of natural uranium, limiting exposure to 0.02 working level or less.

5. Storage of licensed concentrations of thorium and uranium onsite pending the availability of an appropriate disposal site.

When concentrations exceed those specified in option 4, long term disposal other than at a licensed disposal site will not normally be a viable option under the provisions of 10 CFR 20.302. In such cases, the thorium and uranium may be permitted to be stored onsite under an NRC license until a suitable method of disposal is found. License conditions will require that radiation doses not exceed those specified in 10 CFR Part 20 and be maintained as low as reasonably achievable.

Before approving an application to dispose of thorium or uranium under options 2, 3, or 4, NRC will solicit the view of appropriate State health officials within the State in which the disposal would be made.

Dated at Silver Spring, Maryland this 19th day of October, 1981.

Richard E. Cunningham,

Director, Division of Fuel Cycle and Material Safety, Office of Nuclear Material Safety and Safeguards

[FR Doc. 81-30808 Filed 10-22-81 8:45 am]

BILLING CODE 7590-01-M

OFFICE OF PERSONNEL MANAGEMENT

Postponement of Application Deadline for Fund-Raising Privileges Among Federal Employees by Private Voluntary Organizations

Section 5.43 of the "Manual on Fund-Raising Within the Federal Service for Voluntary Health and Welfare Agencies" sets December 1 of each year as the deadline by which national voluntary agencies must submit applications for participation in the Combined Federal Campaign (CFC) to be conducted in the fall of the following year. This year's deadline is being postponed from December 1, 1981, to February 1, 1982. In June 1981, the U.S. Office of Personnel Management (OPM) announced that the eligibility criteria for participation in the 1982-83 CFC are being reviewed. The deadline date is being postponed to avoid national voluntary agencies having to revise their applications to meet eligibility criteria which may be changed.

Donald J. Devine,

Director.

[FR Doc. 81-30730 Filed 10-22-81 8:45 am]

BILLING CODE 8325-01-M

OFFICE OF THE UNITED STATES TRADE REPRESENTATIVE

Resolution of Complaint of Price-Undercutting of Subsidized Cheese Imports

On October 1, 1981, the United States Trade Representative received a letter from the Secretary of Agriculture informing him of the Secretary's finding that imported Grade A Swiss type cheese produced in Finland has been offered for sale in the United States at duty-paid wholesale prices which are five cents per pound less than the domestic wholesale market price of similar cheese produced in the United States.

In accordance with Section 702(c)(2) of the Trade Agreements Act of 1979 (the Act) (19 U.S.C. 1202 note), the Office of the United States Trade Representative notified Finland of the price undercutting determination made by the Secretary of Agriculture, requested that corrective action be taken, and asked for appropriate assurances concerning the commitments made in the Arrangement Between the United States and Finland Concerning Cheese.

On October 14, 1981, Finland notified the United States Trade Representative that measures have been taken to ensure that the duty-paid wholesale price of imported Grade A Swiss type cheese produced in Finland will not be less than the domestic wholesale market price of similar cheese produced in the United States. In addition, Finland gave assurance that it will respect the price commitments in the Arrangement. Since the above notification by Finland has occurred within the 15-day period provided in Section 702(c)(3) of the Act, the United States Trade Representative has notified the Secretary of Agriculture of his belief that no further action is required.

William E. Brock,

United States Trade Representative

[FR Doc. 81-30684 Filed 10-22-81 8:45 am]

BILLING CODE 3190-01-M

SECURITIES AND EXCHANGE COMMISSION

[Release No. 22236; 70-6650]

Arkansas Power & Light Co.; Proposed Issuance and Sale of First Mortgage Bonds

October 19, 1981.

Arkansas Power & Light Company

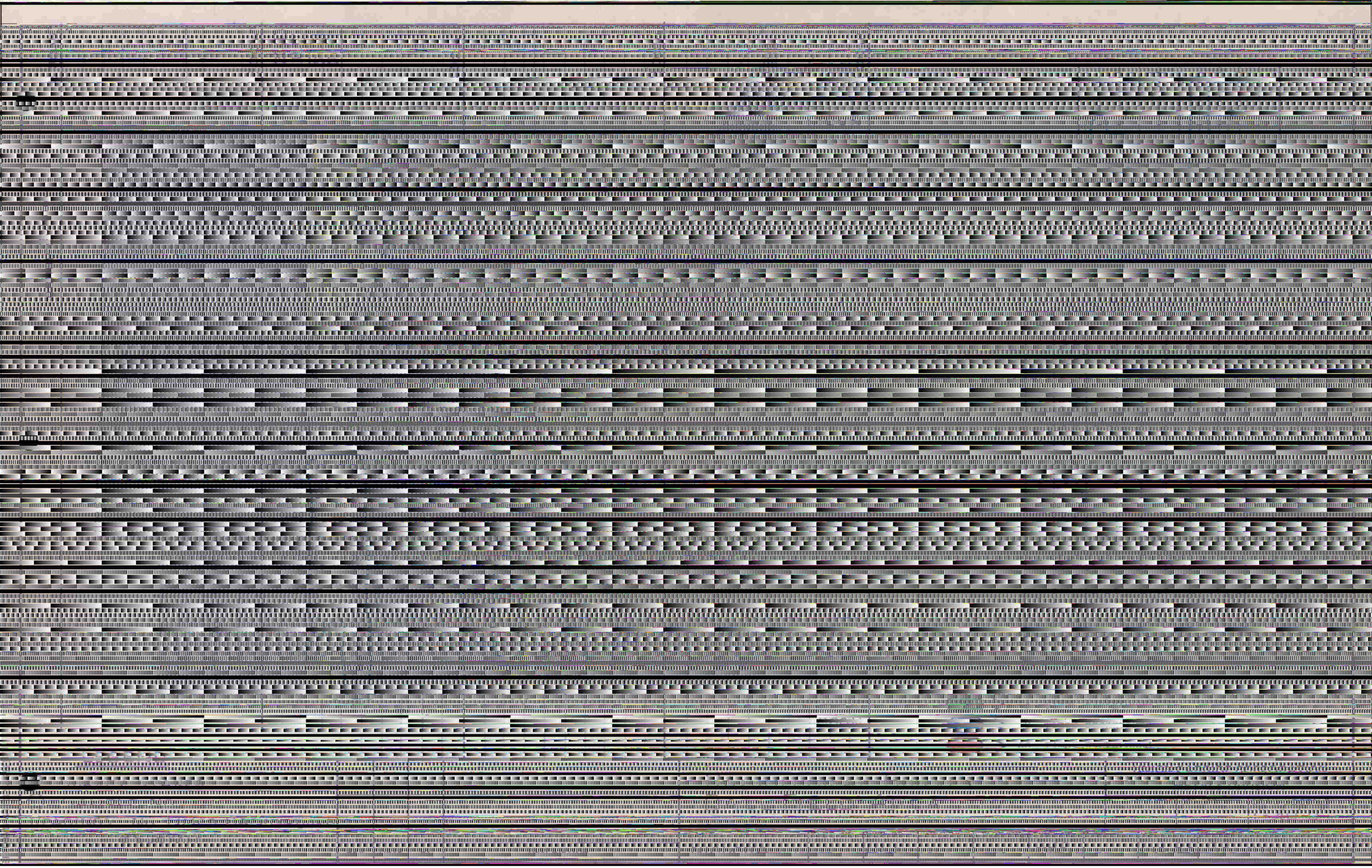

TABLE III

SAMPLE NO.	CHEMICAL ANALYSIS URANIUM/THORIUM pCi/gm DEPTH IN INCHES									GAMMA X BKg SURFACE
	0	3	6	9	12	15	21	24	26	
1	14/40									9
2	11/19									6
3	26/61									12
4	26/66									17
5	8/22	11/19								8
6	6/12									8
7	11/28									6
8	6/6									5
9	11/11									3
10	8/12									13
11		3/2		<3/3						1
12	42/105	<3/1		<3/3	<3/3					21
13	82/201		<3/<1		<3/2					33
14		57/164		<7/<8		<7/3	7/2		3/3	26
15	466/382		27/7	30/12		30/3		23/3		83

NEW YORK STATE REGULATIONS - LICENSE BUT UNRESTRICTED
URANIUM 57 pCi/gm
THORIUM 37 pCi/gm (See report for calc.)

NRC PROPOSED REGULATIONS - DELICENSE & UNRESTRICTED
URANIUM 10 pCi/gm
THORIUM 10 pCi/gm

UNION CARBIDE CORPORATION
METALS DIVISION
137 47TH STREET, P O BOX 97, NIAGARA FALLS, N Y 14302
TELEPHONE 716 278 3000
CABLE TWIX NO 710 524 1664

TECHNOLOGY DEPARTMENT
— ENGINEERING

October 1, 1984

South Carolina Department
Health Environmental Control
2600 Bull Street
Columbia, SC 29201

ATTENTION: HEYWARD G. SHEALY, CHIEF
BUREAU OF RADIOLOGICAL HEALTH

Dear Sir:

This letter is in response to your letter of September 18, 1984, which requires our submittal of corrective measures being taken to eliminate the stated violation of section 1.2, Department Regulation 61-83, and compliance with all applicable requirements and regulations.

There is, of course, no excuse for the omission of the package label "Class A," but an explanation of the circumstances under which it happened will clarify the problem.

We were making simultaneous shipments to Chem-Nuclear at Barnwell, South Carolina, and our plant at Uravan, Colorado. The material being shipped to both locations is from the same cleanup activity. Clean soil with higher concentrations (0.13%) of uranium is being shipped to Uravan for processing while soil with debris and low uranium concentrations is being shipped to Barnwell. Our contractor mistakenly labeled the Uravan shipments "Class A" and omitted the label on the Barnwell shipment. All shipping to Uravan is completed. Therefore, a mix up like this will not happen again.

We apologize for the inconvenience and appreciate that no further enforcement action is anticipated. If additional information is required, please contact the writer.

Sincerely,

Lee G Evans

Lee G. Evans
Project Engineer

lb

UNION CARBIDE

INTERNAL
CORRESPONDENCE

LJC

UNION CARBIDE CORPORATION
METALS DIVISION

P O BOX 579 4625 ROYAL AVE
NIAGARA FALLS NEW YORK 14302

To (Name) Mr. W. C. Thurber
Division Umetco Minerals Corporation
Location Danbury, CT
Area

Cc: / to

Date August 8, 1984

Originating Dept TECHNOLOGY

Area Niagara Falls, NY

Subject Decontamination of Niagara Technology - Tiger Project

The latest estimate to complete the work is $700,000 vs an Engineering estimate of $360,000 and an actual budget request of $400,000 including management contingency. It is Marietta repeated, even though the area was thoroughly sampled over a three year period by UCC, New York State Department of Health and the DOE. Several things conspired to increase the cost.

1. Sampling indicated activity decreased with depth and an 8" excavation would remove the pyrochlor ore. This was not true. We have hit several bad spots. One in particular is an area 30' long and 3' wide where the activity hasn't decreased but rather increased. It extends under the concrete pads on both sides. It is a hard agglomerate which has required hammers to break it up. The source is unknown but obviously could not have fallen off rail cars and had to be there before the concrete unloading pads were poured. At a depth of 3' we are still 15 times background with no signs of abatement. The backfill will cut surface gamma radiation to background but we don't dare go any deeper. There are other spots that required going down to a meter in depth including holes and trenches in the concrete pads not shown on the drawings. Our total shipping volume is now estimated at 15,700 ft^3 vs a budget estimate of 7,000 ft^3.which included a contingency.

2. Barnwell increased it's burial costs by 3.00$/$ft^3$.

3. The Engineering estimate based on the surface to volume ratio of the Marietta boxes included a 15% add on total box volume vs actual excavated volume. The actual boxes designed for the load increased the volume by 30%.

These three things jointly caused the overrun. We may have trouble getting to background and really have nothing left for future work which may be mandated, as was the case at Marietta. I will give you a complete rundown at the end of the month but for now it is bad news.

R. J. Klotzbach

/mau

SIS 149 880

Mailed to W. C. Thurber 8/8/84

C Neal Carpenter
President
N Kent Baker
Eugene R Brauer
Gordon W Bruchner
Patrick C Dwyer
Robert J Shreve
Dale J Steichen
Robert D Thomas
Gary R Windolph

ARIX

A Professional Corporation

Engineers Architects Planners

1005 North 12th Street
Suite 202
Grand Junction Colorado 81501
303 242 6203

Date September 20, 1984

Project No.

To Mr. Lee Evans
Umetco Minerals Corporation
137 47th Street
Niagara Falls, New York 14302

Project Radiation Survey of Haulage Trucks

Gentlemen

We are transmitting Herewith X Under Separate Cover ____

No of Copies	Description or Remarks
1	Radiological Resease, Load. No. 615-4009
1	Radiological Release, Load No. 615-4010

- [ ] No Exceptions Taken
- [ ] Make Corrections Noted
- [ ] Amend & Resubmit
- [ ] Rejected - Resubmit
- [ ] As Indicated on Each Submittal

- [X] As Requested
- [ ] For Approval
- [ ] For Your Records
- [ ] _____

Respectfully,

ARIX, A Professional Corporation

By _____
J. Tell Tappan, Director
Radiological Assessments Dept.

C Neal Carpenter
President
N Kent Baker
Eugene R Brauer
Gordon W Bruchner
Patrick C Dwyer
Robert J Shreve
Dale J Steichen
Robert D Thomas
Guy R Windolph

ARIX RADIOLOGICAL RELEASE
FOR
UNRESTRICTED USE OF EQUIPMENT

A Professional Corporation
Engineers Architects Planners

1005 North 12th Street
Suite 2B
Grand Junction Colorado 81501
303 242 6203

To Whom It May Concern:

The services of ARIX are governed by the legal doctrine of reasonable skill and care in the performance of our work. In the professional opinion of ARIX staff members, the equipment and associated radioactivity measurements listed below meet the criteria set forth by the U.S. Nuclear Regulatory Commission (ANNEX A, Guidelines For Decontamination of Facilities and Equipment Prior to Release For Unrestricted Use, dated November 1976) and adopted by the Colorado Department of Health.

VEHICLE

Operator's Name: HAROLD WILLIAMS Truck I.D.: 886

Load No. 615-4009 Trailer I.D. 253159

ALPHA RADIOACTIVITY (dpm/100cm^2)

Average: None detected (5,000 allowable) Maximum: None detected (15,000 allowable) Removable: None detected (1,000 allowable)

Inst. Type Eberline Gas Proportional & Probe S/N 4076

Removable. Eberline SPA-2 Zinc Sulfide Detector

BETA-GAMMA RADIOACTIVITY (dpm/100cm^2)

Average: 714 (1,000 allowable) Maximum: 1428 (3,000 allowable) Removable: None detected (200 allowable)

Inst. Type Ludlam Pancake Probe S/N 17723

Surveyed By ARIX, A Professional Corporation

Rick Sartain — Signature
Rad Tech — Title
9-17-84 — Date

C Neal Carpenter
President
N Kent Baker
Eugene R Brauer
Gordon W Bruchner
Patrick C Dwyer
Robert J Shreve
Dale J Steichen
[illegible]rt D Thomas
[illegible] R Windolph

ARIX RADIOLOGICAL RELEASE

FOR

UNRESTRICTED USE OF EQUIPMENT

A Professional Corporation

Engineers Architects Planners

1005 North 12th Street
Suite 2B
Grand Junction Colorado 81501
303 242 6203

To Whom It May Concern·

The services of ARIX are governed by the legal doctrine of reasonable skill and care in the performance of our work. In the professional opinion of ARIX staff members, the equipment and associated radioactivity measurements listed below meet the criteria set forth by the U S Nuclear Regulatory Commission (ANNEX A, Guidelines For Decontamination of Facilities and Equipment Prior to Release For Unrestricted Use, dated November 1976) and adopted by the Colorado Department of Health.

VEHICLE

Operator's Name: Virgil Starchuc Truck I.D. 84068

Load No. 615-4010 Trailer I.D. 254075

ALPHA RADIOACTIVITY (dpm/100cm^2)

Average: None detected (5,000 allowable) Maximum: None detected (15,000 allowable) Removable: None detected (1,000 allowable)

Inst. Type Eberline Gas Proportional ∝ Probe S/N 4076

Removable. Eberline SPA-2 Zinc Sulfide Detector

BETA-GAMMA RADIOACTIVITY (dpm/100cm^2)

Average: 714 (1,000 allowable) Maximum: 2857 (3,000 allowable) Removable: None detected (200 allowable)

Inst. Type Ludlam Pancake Probe S/N 17723

Surveyed By ARIX, A Professional Corporation

Rick Sartain — Signature

Rad Tech — Title

Sept 17, 1984 — Date

UNION CARBIDE CORPORATION P O BOX 579 4625 ROYAL AVE. NIAGARA FALLS, N Y 14302
METALS DIVISION

August 6, 1984

Mr. John Oxaal
Elkem Metals Company
Niagara Falls, NY

Subject: Decontamination of Technology Property

Dear John:

We are decontaminating the south portion of the railroad tracks shown in Figure 2, "Location of Elevated Gamma-Ray Levels (indicated by shading) in the Technology Area at UCC-MD, Niagara Falls, NY", appended to Tiger Project letter in conjunction with closing June 30, 1981, signed by F. C. Kroft, Jr. Our purpose is to cancel New York State License No. 950-0139 which allows us to possess and process natural radioactive thorium-bearing pyrochlore ore used for the production of ferrocolumbium and meet NRC proposed regulations for delicensing and unrestricted land use.

To accomplish these ends we are backfilling the area excavated with clay because our experience at Marietta shows we must provide a covered area suitable for soil sampling. Elkem's position is the backfilling with clay is inappropriate cover for access and full use of the loading pads in the area which they intend to use for bulk storage.

Accordingly, after our license has been cancelled and full and unrestricted use of the area is allowed, without reservations regarding ground cover or New York State imposed restrictions concerning future work, Union Carbide at its sole cost and expense will perform the following work:

(1) Reexcavate the area to a minimum depth of six inches, but not to the original depth of the excavation which ranges from nine inches to over two feet in some areas.

Fabric

(2) Install a permeable liner over the remaining clay as a free draining support for crushed stone.

(3) Backfill the newly excavated area with gravel to a depth to be determined by your engineers but not exceeding six inches.

(4) Dispose of the approximately 300 yards of clay which is excavated.

The work as outlined is contingent on Union Carbide receiving permission for unrestricted access without conditions imposed by New York State Department of Labor, Division of Safety and Health or the Federal Nuclear Regulatory Commission or the Federal Environmental Protection Agency.

If the foregoing correctly sets forth the understanding and agreement of the parties, kindly execute this letter agreement in the space provided below.

Very truly yours,

Union Carbide Corporation

By: _____

Title: _____

Agreed To and Accepted:

Elkem Metals Company

By: _____

Title: _____

cc: Mr. R. F. X. Fusaro
Mr. W. C. Thurber

Note to Fusaro and Thurber:

I made this agreement with Oxaal but it probably requires Thurber's signature.

NUS PROCESS SERVICES

August 3, 1984

Mr. Lee G. Evans
Umetco Minerals Corporation
P.O. Box 97
Niagara Falls, NY 14302
Cornelius, NC 29031

Dear Lee:

This is to advise you that NUS Process Services, acting as your agent at the Barnwell, South Carolina Waste Disposal Site First Come/First Serve Volume Allocation Plan, has obtained 1859 ft^3 of burial space for use in the month of November, 1984.

Thank you for utilizing our services, and if I can be of any further service, please do not hesitate to contact me at (803) 256-4355.

Sincerely,

Earl E. Reagan, Jr.

Earl E. Reagan, Jr.
Supervisor
Transportation Services

EERjr/fmw
cc: R. Voit

NUS PROCESS SERVICES

June 7, 1984

Mr. Lee Evans
UMETCO Minerals Corporation
P.O. Box 97
Niagara Falls, New York 14302

Dear Mr. Evans:

This is to advise you that NUS Process Services, acting as your agent at the Barnwell, South Carolina Waste Disposal Site First Come/First Serve Volume Allocation Plan, has obtained 1916 ft^3 of burial space for use in the month of September, 1984.

Thank you for utilizing our services, and if I can be of any further service, please do not hesitate to contact me at (803) 256-4355.

Sincerely,

Earl E. Reagan, Jr.

Earl E. Reagan, Jr.
Supervisor
Transportation Services

EER/fmw

South Carolina Department of Health and Environmental Control

2600 Bull Street
Columbia, S C 29201

Commissioner
Robert S Jackson, M D

September 18, 1984

Mr. Lee G. Evans, Project Engineer
Union Carbide Corporation
Metals Division
P.O. Box 97
Niagara Falls, New York 14302

Dear Mr. Evans:

As a result of an investigation conducted by the South Carolina Department of Health and Environmental Control on September 13, 1984, of your radioactive waste shipment upon its arrival at the Chem-Nuclear burial facility in Barnwell, South Carolina, certain violations of applicable state and federal regulations were determined.

The violation is identified as follows:

Radioactive Waste Shipment No. 0984-214-A, classified as Radioactive Material, LSA, n.o.s., described as solid metal oxides of soil, rubble, and hardware, and contained in 6 wooden crates was found not to have the waste classification marked on the packages. This is contrary to the requirement of Condition 31 of S.C. Radioactive Material License No. 097, issued to Chem-Nuclear Systems, Inc. and constitutes a violation of Section 1.2, Department Regulation 61-83.

Please be advised that this is a warning communication. The Department does not anticipate further enforcement action for this particular violation. However, repeat offenses of this nature will result in stricter sanctions. Therefore, you are required to submit to the Department no later than October 8, 1984, your corrective measures to ensure full compliance with all applicable requirements and regulations.

Should you have any questions, please contact Mr. Virgil R. Autry at (803) 758-7951.

Very truly yours,

Heyward G. Shealy

Heyward G. Shealy, Chief
Bureau of Radiological Health

HGS:kn

UNION CARBIDE CORPORATION P O BOX 579 4625 ROYAL AVE NIAGARA FALLS N Y 14302
METALS DIVISION

May 4, 1984

Mr. H. Michaels
New York State Department of Labor
Division of Safety & Health
69th Floor
2 World Trade Center
New York, NY 10047

212-488-[illegible] TTP

Subject: Radioactive Materials License 950-0139

Dear Mr. Michaels:

Attached is a plot plan of the area you wish to sample. Gamma readings on 10-foot centers are shown as times background.

The center lines of the railroad tracks are shown. This plan should give you a good basis for planning your sampling and estimate the amount of time involved.

"Ball Field Area" is a phrase which should be ignored in that it is 60-years old terminology used for internal descriptive orientation. It has not been a ball field since before World War II.

Grab sample areas are shown as circled numbers. Uranium and thorium analysis converted to pCi/gram are indicated in the box on the right with reference to the sample locations.

Please inform me of your schedule.

Very truly yours,

R. J. Klotzbach

/mau
Attachment

cc: Messrs: L.G. Evans
W.C. Thurber
R.A. Crago/R.E. DeWeese - Elkem

UNION CARBIDE CORPORATION P O BOX 579 4625 ROYAL AVE NIAGARA FALLS N Y 14302
METALS DIVISION

May 2, 1984

Ref'd to TJK / file
For

RECT MAY 3

Noted by
File
Subject 11309

Mr. Robert F. Kelly
Senior Radiologist
New York State Department of Labor
State Office Building
65 Court Street
Buffalo, NY 14202

Subject: Radioactive Materials License 950-0139 - Status Report

Dear Mr. Kelly:

We have obtained burial allocation at Barnwell, SC for August 1984 in the amount of 1900 ft^3.

Based on our volume estimate of 7000 ft^3, it will take us all of 1984 and into 1985 to complete the burial because competition for space tends to intensify at the end of the year.

However, your verbal request to delay the work pending a New York State Department of Health survey, not scheduled by H. Michaels until the end of May, will seriously delay the project resulting in loss of allocated burial space. Future schedules depend on the rapidity with which you receive analytical results, make your judgements and issue approval to proceed.

We cannot commit any manpower or funding to a project which has not received the approval of your department. That is the nature of any endeavor involving a state or federal license where a clear cut approved end result is projected which must receive prior approval from the regulatory agency. I would be remiss in my accountability for our limited resources if I acted otherwise.

Up to this point we had your verbal approval as Health Department Representative to proceed with the action plan transmitted to you on April 4, 1984. Since this is not the case, when your department completes its investigation, written approval for the contemplated actions is necessary for the commitment of Union Carbide resources. I now doubt we can complete the work before July 31 and the schedule transmitted to you in my April 4 reply to your March 29, 1984 reissue of your notice of inspection findings, based on a previous New York State survey, is voided.

UC 149 2

UNION CARBIDE

INTERNAL CORRESPONDENCE

UNION CARBIDE CORPORATION 137-47th Street PO BOX 97 NIAGARA FALLS NY 14302
METALS DIVISION

To (Name) Mr. R. J. Klotzbach
Division
Location Umetco Minerals Corporation
Area Niagara Falls, NY

Date May 1, 1984

Originating Dept. TECHNOLOGY DEPARTMENT — ENGINEERING

Area

Copy to Messrs. T. J. Kagetsu
F. T. Temple
G. E. Walck
File: 11309

Subject Soil Decontamination - South of Bldg. 166, Niagara

We have obtained a burial allocation at Barnwell, SC, for August 1984 of 1900 ft.^{3}. Competition for space tends to intensify toward the end of each year. (WE REQUESTED 3000 ft^3)

Based on our volume estimate of 7000 - 8000 ft.^{3}, it will take us all of 1984 and maybe into 1985 to complete the burial.

All of the soil, however, will be excavated and packaged by August 1 and stored in the Niagara Plant. I have contacted Frank Temple regarding a suitable storage site. This should bring us into compliance with our NYS Radioactive Material License (950-D139).

I'll keep you posted.

L J Evans

cc: L. G. Evans

/dac8

Since our meeting in the first week of April we have performed the following:

April 6	1.	Hired agents at Barnwell, SC.
April 13	2.	Applied for shipping permit.
April 17	3.	Released $33,000 of engineering funds and started detail work.
April 18	4.	Began preparation of work descriptions and purchase orders.
April 25	5.	Cleaned up the area for equipment access.
April 25	6.	Received shipping permit.
May 1	7.	Received partial burial space allocation.

As you can see, in a period of three weeks we have actively pursued every phase of the project and acted in good faith by issuing documented status reports to you covering each of those items. Nobody has raised any question until the request for "holdup of cleanup." If you issue written approval to proceed, as planned, we will not hold up anything pending your survey except the actual excavation which we must be prepared to begin by June 15.

We will await your advice and approval for this corrective action.

Very truly yours,

R. J. Klotzbach
Director of Technology

/mau

cc: Messrs. W. C. Thurber
L. G. Evans
R. A. Crago/R. E. DeWeese - Elkem

cc TJK
FILE 11309

UNION CARBIDE CORPORATION P O BOX 579 4625 ROYAL AVE NIAGARA FALLS N Y 14302
METALS DIVISION

April 30, 1984

Mr. Robert F. Kelly
Senior Radiologist
New York State Department of Labor
State Office Building
65 Court Street
Buffalo, NY 14202

Subject: Radioactive Materials License 950-0139

Dear Mr. Kelly:

As you requested on this date I am forwarding the survey data we made to define our problem in the area contaminated by ore unloading operations.

You should have in your files the result of the New York State survey made in December 1981 which resulted in a citation for failure to meet licensing requirements. Your survey may be more accurate than ours.

In order to expedite this matter, I am attaching our internal design memo describing the problem and our alternates for solution. This memo should be considered Union Carbide confidential information released to your department in answer to questions which you have raised related to the citation.

The detailed cost estimates have been deleted from this copy but are summarized on Page 9. You can see we have adopted the permanent solution alternative requiring the highest expenditure of funds, contrary to the engineers' recommendation. In addition, our costs have escalated to $400,000 from the $335,000 estimate in the memo.

The information you require for the gamma probes is on Page 3. A drawing of the entire suspect area is enclosed with gamma survey readings on 10 foot centers.

Chemical analysis of "grab" samples were made and a table is displayed converting to pCi/gram. These samples were taken primarily to determine the extent and depth of both thorium and uranium contamination since, at the time, we did not know the source of the original spillage. The high thorium is a definite signature that the source was primarily columbium bearing ores.

Table III shows that sampling for chemical analysis was done at depth for the areas displaying the highest surface contamination. Activity decreases dramatically with depth so we are certain we have no long standing problem and a fix can be made.

We intend to do in-house monitoring while the work is in progress. We will not complete our efforts until (1) an independent survey is made, and (2) your department conducts it's own survey on the decontaminated area. Our independent surveyors have not as yet been hired but the paper work for purchase and work scope agreements is in preparation. We will keep you informed.

Please feel free to call me about our progress or any other details you require. I will continue to send you status reports.

Very truly yours,

R. J. Klotzbach
Director of Technology

/mau
Attachment

cc: Messrs. W. C. Thurber w/a
L. G. Evans
R. A. Crago/R. E. DeWeese - Elkem

cc TSK
FILE 11309

UNION CARBIDE CORPORATION P O BOX 579 4625 ROYAL AVE NIAGARA FALLS N Y 14302
METALS DIVISION

April 26, 1984

Mr. Robert F. Kelly
Senior Radiologist
New York State Department of Labor
State Office Building
65 Court Street
Buffalo, NY 14202

Subject: Radioactive Materials License 950-0139 - Status Report

Dear Mr. Kelly:

The area around the railroad tracks which contains low level radioactive ore contamination has been cleared permitting work to proceed. Clearance of railroad flat cars and other stored materials was completed on April 25, 1984.

Detailed engineering for contractor work has begun with the release of engineering funding to an active project on April 17, 1984.

Very truly yours,

R J Klotzbach

R. J. Klotzbach
Director of Technology

/mau
Attachment

cc: Messrs. W. C. Thurber w/a
L. G. Evans
R. E. DeWeese - Elkem w/a

4-25-89

MEMO TO LEE EVANS:

WENT OUT TO SITE SOUTH OF BLDG 166 (1:30 - 2:30 PM)

MET KLOTZ & MURPHY - LATER DICK CRAGO.

ELKEM IS SEPARATING MATERIAL TO REMAIN IN STORAGE AND SCRAP. THE SCRAP WILL BE DISPOSED OF SHORTLY - OTHER MATERIAL STORED ON SOUTH END OF MAIN CONCRETE PAD.

DON HANSEN KNOWS HISTORY OF MATERIALS, WHICH UMTCO NEEDS TO MOVE OR DISPOSE OF - SUCH AS K-R (Low Chrome) PELLETS IN WOODEN SKIPS (POSSIBLE FOR USE AS BACKFILL) AND FERROPHOS; IN RUSTY STEEL DRUMS - CONDITION OF SKIPS & DRUMS MAKE MOVEMENT OF THE MATERIALS VERY DIFFICULT.

IT WAS AGREED WITH KLOTZ & MURPHY AND AGAIN LATER WITH CRAGO THAT THE TRACKS TO BE TAKEN UP ~~ARE~~ ARE NOT TO BE REPLACED - RAILS ARE ELKEM PROPERTY (PER KLOTZ) AND ~~THEN~~ CAN BE CUT-UP AND STORED ON A PAD AND IF CLEAN BE SOLD BY ELKEM AS SCRAP, THE TIES CHECKED FOR RADIOACTIVITY AND IF AFTER CLEANING FOUND TO BE CLEAN CAN BE GIVEN AWAY, IF NOT, SHIP OUT IN BOXES.

KLOTZ WOULD LIKE BOXES LINED WITH A SUITABLE LINER TO INSURE NO LEAKAGE.

MURPHY SUGGESTED A LINER SIMILAR TO WHAT THEY USE IN THEIR 4' SKIP BOXES (THESE ARE SIMILAR TO THE "BOX" WE USED)

WE WILL HAVE TO SEE HANSEN ABOUT MOVING "OUR" MATERIALS.

RAILROAD FLAT CARS HAVE BEEN MOVED TO A LOCATION NEAR BLDG 105 OUT OF OUR WAY.

BUILDING 105 NOT AVAILABLE FOR STORAGE.

COPY TO: T.J.K
FILE 11309.

GIL

UNION CARBIDE CORPORATION P O BOX 579 4625 ROYAL AVE NIAGARA FALLS N Y 14302
METALS DIVISION

April 27, 1984

Mr. Robert F. Kelly
Senior Radiologist
New York State Department of Labor
State Office Building
65 Court Street
Buffalo, NY 14202

Subject: Radioactive Materials License 550-0139

Dear Mr. Kelly:

Attached is a copy of our permit to transport wastes in South Carolina, dated April 23, 1984, applicable to the disposal of wastes at Barnwell.

Very truly yours,

R. J. Klotzbach
Director of Technology

/mau
Attachment

cc: Messrs. W. C. Thurber
L. G. Evans
R. A. Crago/R. E. DeWeese - Elkem

RJK

Form RHA-P
(10/80)

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

SOUTH CAROLINA RADIOACTIVE WASTE TRANSPORT PERMIT

Refr'd to _____
For _____
RECD APR 27 1984 RJK
Noted by _____
File _____
Subject _____

Pursuant to Act No. 429 of 1980, the South Carolina Radioactive Waste Transportation and Disposal Act, a Radioactive Waste Transport Permit is hereby issued to the below-named applicant (shipper). This permit shall not, in itself, be construed as authorizing a shipper to dispose of radioactive waste within the State of South Carolina. This permit shall not be transferred, assigned or in any manner disposed of, either voluntarily or involuntarily, directly, or indirectly, through transfer of control to any person, unless the Department shall, after securing full information, find the transfer is in accordance with the provisions of Act No. 429 and shall give written consent.

1. Name and Address of Applicant (Shipper): Union Carbide Corporation Metals Division P.O. Box 97 Niagara Falls, New York 14302 (Marietta, Ohio)	2. Permit Number: 0211-31-84-X 3. Expiration Date: December 31, 1984

1984

For the South Carolina Department of Health and Environmental Control

April 23, 1984
Date of Issuance
DHEC 801 (10/80)

By Heyward G. Shealy
Heyward G. Shealy, Chief
Bureau of Radiological Health

UNION CARBIDE CORPORATION P O BOX 579, 4625 ROYAL AVE, NIAGARA FALLS, N Y 14302
METALS DIVISION

April 18, 1984

Mr. Robert F. Kelly
Senior Radiologist
New York State Department of Labor
State Office Building
65 Court Street
Buffalo, NY 14202

Subject: Radioactive Materials License 950-0139

Dear Mr. Kelly:

My program for decontamination of the Union Carbide, Niagara, Royal Avenue Site outlined a two step program. Nevertheless we are proceeding on the basis of a one step program, without intermediate storage, provided our agents can obtain readily available burial space at Barnwell, South Carolina. We decided on this course of action on the assumption that Barnwell would not be accessible to a Northeastern zone client after 1985. Attached is a copy of our first step to insure proper channels to secure burial space. This is in accordance with my promise to keep you informed of new developments and possible changes in the program.

I assume that you are taking steps to modify or issue a new license for the unknown quantity radium source we examined on your last visit. Since I intend to dispose of that source at the same time as the radioactive ground cover I would appreciate receiving your advise on proper disposal containers and methods.

Very truly yours,

R. J. Klotzbach
Director of Technology

/mau
Attachment

cc: Messrs. W. C. Thurber
L. G. Evans
R. E. DeWeese - Elkem

UNION CARBIDE CORPORATION
METALS DIVISION
137 47TH STREET, P O BOX 97 NIAGARA FALLS N Y 14302
TELEPHONE 716 278 3000
CABLE TWIX NO 710 524 1664

TECHNOLOGY DEPARTMENT
— ENGINEERING

April 6, 1984

Chem-Nuclear Systems, Inc.
P.O. Box 726
Barnwell, SC 29813

Attn: Mr. James Purvis
Director of Regulatory Affairs

Dear Mr. Purvis:

This letter authorizes Messrs. Earl Reagan, Anthony Chavis, or Doug McLean of NUS Process Services Corporation to act as our agent to obtain burial space at the Chem-Nuclear site in Barnwell, South Carolina.

If there are any questions regarding this matter, please contact Mr. L. G. Evans at Telephone No. (716) 278-3462 or Mrs. S. C. Zambotti at Telephone No. (716) 278-3232.

Sincerely,

S C Zambotti
Mrs. S. C. Zambotti
Purchasing Agent

SCZ/jl
cc: Earl Reagan
R. J. Klotzbach

INTERNAL
CORRESPONDENCE

UNION CARBIDE CORPORATION
METALS DIVISION

P O BOX 579 4625 ROYAL AVE
NIAGARA FALLS NEW YORK 14302

To (Name) Mr. F. V. McMillen
Division Metals Division
Location Danbury, CT
Area

Date March 20, 1984
Originating Dept. TECHNOLOGY
Area Niagara Falls, NY

Copy to Messrs:
L. G. Evans
F. T. Temple
W. C. Thurber

Subject Cleanup of Radioactive Contamination
Building 166

We should accrue $400,000 of corporate money to bring the Niagara site into compliance for delicensing of the New York State Radioactive Materials License No. 950-0139 because of radioactive source concentrations in excess of 500 ppm behind Niagara Building 166. We are also obligated to do this in accordance with the Tiger agreement for unrestricted use of the area by Elkem.

The volume to be removed and eventually shipped to a burial repository is 6800 ft^3. The cost covers removal, shipping and burial.

The preferred action plan is to relocate the waste temporarily on Niagara Plant property, in a fenced area for restricted access, and then ship and bury at a later date. The relocation cost for Phase 1 is $125,000 and the shipping and burial cost is $275,000 in Phase 2. The cost assumes burial at Barnwell, South Carolina.

Access to the repository at Barnwell will be restricted after 1985 to regional member states. New York will not be a regional member and at this time there is no Northeast Regional Repository. Also, we can't just ship any volume, at any time, to Barnwell but must fit into their schedule with definite specified volumes over a time frame. It seems unlikely this could be done in 1985. Phase 1 can proceed as soon as the area is sufficiently cleaned of interfering stored materials.

R. J. Klotzbach

/MAU

615 149 680

March 19, 1984

To RJK

From LSE

Subject: Clean up Options - Norgaard

Attached is the design memo which is unchanged since being issued July 13, 1983. All estimates are in 1983 dollars. The following comments are offered in connection with money requests.

1) The contaminant volume reported 6800 ft^3 is confined to the area behind Bldg 166 Contamination may exist elsewhere in the Norgaard plant

2) Access to the Repository at Barnwell, SC. will be restricted after 1985 to regional member states. NE states not incl.

3) The cost to relocate to Norgaard Plant $120,000

4) Cost to dispose at Barnwell, SC $335,000

5) Cost to relocate to Norgaard Plant & later ship to Repository $390,000

cc TJK

UNION CARBIDE CORPORATION
METALS DIVISION
P O BOX 579 4625 ROYAL AVE NIAGARA FALLS NEW YORK 14302

July 7, 1982

Mr. R. F. Kelly
Occupational Safety and Health
65 Court Street
Buffalo, NY 14202

Dear Mr. Kelly

We would appreciate an extention to the 90-day deadline we received with your Notice of Inspection Findings concerning concentrations of source material Our intention at this time is to decontaminate the areas and store the material on site until disposal alternatives are fully investigated. I will be applying for a license amendment once we have determined details such as volume, storage site location, fencing, etc.

Very truly yours,

D. R Brosnahan
Radiation Safety Officer

DRB smn

cc: Dr. D J. Hansen

August 11, 1982

To: Dr. T. J. Kagetsu
Mr. L. G. Evans

From: F. A. Rutledge

Subject: Contaminated Area South of Building 166 -
Letter D. R. Brosnahan to D. J. Hansen, 6/17/82

I met with Lee Evans and Dave Brosnahan on Tuesday afternoon, August 10, 1982, to review decontamination requirements for the subject area. The following was discussed and may be used as a basis for an action plan:

1. Develop a sampling plan to firmly establish the area of contamination; i.e., pattern of sample holes and depth to check, etc. - Most sample → Dave & Coo - Start last week Sept

2. Establish degree of clean-up required:

Try → a. Comply with State of New York requirements--55 pCi/g?
b. Comply with EPA regulations for unrestricted use--10 pCi/g?
c. Something in between?

3. Determine volume of material to be disposed of based on degree of clean-up established--2a, 2b, or 2c.

4. Determine disposal location:

a. Load and ship to approved repository?
b. Load and ship to Uravan for processing?
Try → c. Load and move to another area of UCC Niagara Plant, and fence?
d. Some other approved disposal method?

5. Develop cost estimate based on degree of clean-up required and method of disposal agreed upon.

Scrap w/ ck w/ Murphy → 6. Develop plan to dispose of scrap and remove railroad tracks that interfere with removal of residue. Check scrap for contamination prior to disposal, especially embedded railroad ties.

7. Award contract to excavate material to satisfy conditions of 2a, 2b, or 2c and ship or relocate as determined by 4a, 4b, 4c, or 4d.

8. Check area for compliance.

9. Replace railroad tracks. ?

I recommend that a meeting be held to reach an agreement on options outlined in Items 2 and 4 above and also to establsh a general time frame for the project.

FAR/cep

F. A. Rutledge

August 11, 1982

To: Dr. T. J. Kagetsu
Mr. L. G. Evans

From: F. A. Rutledge

Subject: Contaminated Area South of Building 166 -
Letter D. R. Brosnahan to D. J. Hansen, 6/17/82

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2. Establish degree of clean-up required:

   a. Comply with State of New York requirements--55 pCi/g?
   b. Comply with EPA regulations for unrestricted use--10 pCi/g?
   c. Something in between?

3. Determine volume of material to be disposed of based on degree of clean-up established--2a, 2b, or 2c.

4. Determine disposal location:

   a. Load and ship to approved repository?
   b. Load and ship to Uravan for processing?
   c. Load and move to another area of UCC Niagara Plant, and fence?
   d. Some other approved disposal method?

5. Develop cost estimate based on degree of clean-up required and method of disposal agreed upon.

6. Develop plan to dispose of scrap and remove railroad tracks that interfere with removal of residue. Check scrap for contamination prior to disposal, especially embedded railroad ties.

7. Award contract to excavate material to satisfy conditions of 2a, 2b, or 2c and ship or relocate as determined by 4a, 4b, 4c, or 4d.

8. Check area for compliance.

9. Replace railroad tracks.

I recommend that a meeting be held to reach an agreement on options outlined in Items 2 and 4 above and also to establsh a general time frame for the project.

FAR/cep

F. A. Rutledge

AAXON INDUSTRIES INC
P O BOX 1317 GREENWICH CT 06830 · (203) 661-4712 · (212) 686-2670

Dear Sir,

Would you like to:

- Reduce your radioactive or hazardous waste removal costs by as much as 80%?
- Meet stricter disposal requirements?
- Achieve these benefits immediately, using a new disposal system that operates on standard 110-volt electricity and occupies less floor space than a household refrigerator or less than 6½ square feet?

Then you should investigate the PAX compaction systems, the most economical devices available that can provide these important services.

Simplicity and design efficiency form the basis for PAX compactors. A powerful ram-generating 14,000 pounds of thrust over a 30-second cycle-reduces most laboratory wastes to one-fifth its original volume. That means five times as much material can be packed into a standard 55-gallon drum. Since most waste removal companies charge by the number of drums removed, your savings begin immediately. At some institutions, PAX compactors have paid for themselves in less than a year.

You can wheel it in and start compacting-and saving-immediately. No special installation is required. Best of all, the basic PAX system costs only $6500 and comes backed by the technical support of Aaxon Industries' engineering staff.

May I invite you to call or write us directly concerning any questions you may have about the PAX hazardous waste compaction systems.

Sincerely,

Robert J. Roth
President

The PAX combines safe, easy operation with low price Just plug the unit into any standard 20 amp, 110-volt electrical outlet Place the 55-gallon drum into clips on dolly Add waste materials and you are ready to start compacting

Insert and turn the key to unlock the controls and activate the powerful ram that will crush your wet or dry wastes with as much as 14,000 pounds of thrust When you reach your preselected unloading weight, slide the cart back and seal the drum That's all there is to it!

Technical support

Aaxon's engineering staff will assist you in designing a PAX system to meet your individual institution's needs

PAX options extend the systems

Satellite carts

55-gallon containers mounted on dollies with rugged casters can be stationed, at various satellite locations where waste originates When filled, the carts are rolled to the central compactor, then returned to the station, avoiding the purchase of compactors for each location

Venting systems, explosion proof systems, and remote controls

The PAX can be equipped with an exhaust system for venting hazardous aerosols or vapors generated during compaction When venting to the outside is impractical, the unit can be equipped with filter systems For applications involving flammable wastes, an explosion-proof system is available Remote controls are also available for isolated operation

AAXON DISPOSAL SYSTEMS

PAX systems handle wastes safely, efficiently, and saves money

Powerful compacting ram reduces most laboratory wastes to one-fifth original volume Since most waste removal companies charge by the number of drums removed, you start saving immediately In some institutions the compactor has paid for itself in less than a year

Flexible guard seals waste chamber when ram is activated, minimizing dispersion of compacted materials Total ram enclosure is standard Available options include collar for venting, explosion—proof systems and remote controls

PAX systems run on standard 110-volt electric current, so no special installation is needed

Simple, efficient design provides trouble-free compacting The PAX system requires less floor space than the average refrigerator and fits through a standard doorway

Key-locked controls prevent tampering and unauthorized operation

Performance has been rated and certified by the National Solid Wastes Management Association (NSWMA)

Performance data and specifications

Compaction performance:

Total compaction thrust 14,000 pounds for 30-second cycle
Compaction thrust 50 PSI
Variable Compacted Weight 50 to 550 pounds with visual indicator to tell when to unload

Hydraulic specifications·

Hydraulic pump gear type
Maximum operating pressure 3,000 PSI
Average Cycle Time 30 seconds
Cylinder 3" bore, 25" stroke

Electrical specifications:

Motor One horsepower, totally enclosed, 1725 RPM
Operates on 110 volt, 60 cycle current, 20 amp
Grounded outlet
Components UL approved

Controls:

Key activated control with locked "power-off" position
Safety stop button

Structure:

Upright, rigid C-frame configuration
heavy steel base integrally welded
Upright column is 6" x 8" rectangular tube of 3/16" thick steel for maximum rigidity and strength
Corrosion-resistant compacting ram is rigidized by internal grid pattern and fastened to a ½" steel support plate

Dimensions:

Width 26½" Length 34½" Height 78½"

Shipping weight Approximately 950 pounds

PAX

HAZARDOUS WASTE COMPACTOR

Safely Compacts Low L Radioactive and Oth Hazardous Wastes

Compacts Directly in an Approved 55-Gall Shipping Drum

Immediate Savings of to 80% in Waste Removal Cos

Requires Less Than 6½ of Floor Space

AAXON DISPOSAL SYSTEMS

P O BOX 1317 · GREENWICH, CT 06830

AAXON DISPOSAL SYSTEMS

UC 149 2

UNION CARBIDE INTERNAL CORRESPONDENCE

METALS DIVISION • P O BOX 579 4625 ROYAL AVE, NIAGARA FALLS, NEW YORK 14302

To (Name) Dr. D. J. Hansen
Division
Location Niagara Falls, NY

Date May 7, 1982
Originating Dept Mineral Technology
Answering letter date

Copy to Messrs. L. G. Evans
R. J. Klotzbach
R. G. Woolery

Subject Technology Ball Field Area Cleanup

An inspection of the ball field area behind Building 166 by the New York State Department of Labor revealed four areas containing radioactive source material above limits for uncontrolled areas, as established by the State Labor Law. I crudely estimate, with little knowledge of the depth, the volume to be ∿200 cu. ft. Proposed cleanup actions will require the following:

1. Purchase of three Department of Transportation approved 70 cu. ft. caulked wooden boxes.
2. Backhoe and two to three man crew for one to two days.
3. Stone or topsoil backfill.
4. Burial space at Barnwell, S.C. ($14/cu. ft.).
5. Permit for direct shipment to Barnwell.
6. Transport by exclusive use truck.

Total estimated cost is ∿$10,000 plus contingency. Costs for burial at Barnwell are justified on the basis of low volume and unknown legal consequences of entering material into Ohio and Colorado. Burial space cannot be obtained until September 1, requiring storage to meet the present state deadline of July 2.

It must be emphasized that the above likely will not permit termination of license or release for unrestricted use, as may be required for transfer of property ownership. Large areas reported as 20 to 50 times background were within limits set by the State Department of Labor only. Nuclear Regulatory Commission guidelines for decontamination, which I have been referred to by the State concerning a license cancellation, require levels of two to three times background. In this case burial volume will increase tremendously necessitating reevaluation of place of burial, and costs will be astronomical.

D. R. Brosnahan
Radiation Safety Officer

DRB:jk

Lee,

Thought you might enjoy the enclosed. I would like to have it back, as I would like to have the copies of Mining Engineering back.

Why would you volunteer to clean the waste @ Marietta to background? If you have to clean up to background levels you may as well have Bob Beverly inform the State of Colorado that you plan on processing the Elmers building at Uravan to extract the uranium.

The answer to your question yesterday, which I'm sure your very interested in given that you never called back, is 105 ppm. This is calculated as follows:

$$U_3O_8 = 3.33 \times 10^{-7} \text{ Ci/gm} = 333{,}000 \text{ pCi/gm}$$

$$\frac{35 \text{ pCi/gm}}{333{,}000 \text{ pCi/gm}} = .0105\% = 105 \text{ ppm}$$

I would not increase the activity of U_3O_8 by taking the no. of Ci's/gm x 14 isotopes as you do in your calculations. I have a number from a quotable reference that shows that the activity of U_3O_8 ~~is 3.26×10^{-7}~~ in equilibrium with daughters is 3.26×10^{-7} Ci/gm. By increasing the activity of U_3O_8 you are decreasing the value to which you will clean @ Marietta. Given that the enclosed states that the evidence is indisputable that cancer incidences are lower where background radiation levels are higher, you may be responsible for an

increased risk of death because you went too far in cleaning up the residue. I can see it now -

Marietta Gazette

LEE EVANS - KILLER ON THE LOOSE

Madman Lee Evans.....

Dan

One other thing I just remembered. At technology here we are allowed to pour 3 g/l V_2O_5 down the drain - be it dissolved or in particulate form. This cannot average more than 92 ppm over the year - based on permitted concentrations in water above natural background in OH State Industrial Code Rule 38 - Ionizing Radiation Protection. A study as to whether a sewer of sufficient tailorage exists in Marietta to permit disposal by way of the Ohio River may be warranted. I may be clear out to lunch on this but it is worth a look-see. (Dilution may be the solution to your pollution).

UC 149-2

UNION CARBIDE **INTERNAL CORRESPONDENCE**

METALS DIVISION • P O BOX 579 4625 ROYAL AVE , NIAGARA FALLS, NEW YORK 143

To (Name) Dr. D. J. Hansen
Division
Location NIAGARA

Date June 17, 1982
Originating Dept Minerals Technology
Answering letter date

Copy to Messrs. R. G. Beverly
L. G. Evans
T. K. Kagetsu
R. J. Klotzbach
F. T. Temple
R. G. Woolery

Subject Technology Decontamination Requirements

In pursuing the State of New York for more of their radiological analyses, I have learned that in fact all nine areas sampled behind Bldg. 166 are out of compliance - not just the four cited. The inspector had assumed that the source material was natural uranium, allowing a maximum activity of 200 pCi/g. The source material is thorium, which due to a lower activity per unit weight, must be reduced to 55 pCi/g to be in compliance with the <0.05% (<500 ppm) requirement.

The state's analyses are as follows:

Area	Gross Activity - Raw pCi's		pCi/g	
	Surface	2 - 2-1/2" Deep	Surface	2 - 2-1/2" Deep
1	5.8	9.5	31.4	132.0
2	2.6	41.7	25.4	107.5
3	6.3	9.5	101.1	136.8
4	47.0	15.2	215.9	108.5
5	37.4	6.0	176.3	45.9
6	1400.6	861.2	3413.3	4056.5
7	34.6	35.8	312.3	207.8
8	17.3	72.9	154.7	249.5
9	9.6	16.6	50.6	98.9

Chemical analyses of surface samples I removed from Areas 5 and 8 are as follows:

	% U_3O_8	% ThO_2
Area 5	0.021	0.23
Area 8	0.039	0.48

Spectrographic analyses of these two areas and Area 6 are attached. The Ta, Cb, and Th contents indicate that the contamination is a residue of ferrocolumbium production and not from the former Area Plant.

Listed below are four possible actions which may bring us into compliance with state regulations:

Case	Action
1	Decontaminate east track to permit track usage requeste by Elkem. Relocate residue within west track and Area Fence and post to control access.
2	Decontaminate along both tracks and Area 6. Relocate residue to neighboring UCC property. Fence and post.
3	Decontaminate as in 2. Ship residue to Barnwell, SC for burial.
4	Decontaminate as in 2. Ship residue to Uravan, CO for processing and disposal as tailings.

Case 1 is the least expensive, but also a short term arrangement due to the chan in property ownership. Case 2 offers the following: 1) Intermediate term solution allowing time to fully investigate disposal alternatives, including the possibility of a dump in the Northeast necessary by 1986 when present dumps can ban waste from outside states. 2) Frees Technology property for change in ownership. 3) Any additional material, such as may be found during any follow-up surveys, can be handled. This case, however, is subject to approval by the State Department of Labor by amendment of our Radioactive Materials License No. 950-0139 - the license authorizing possession of 6000 lb of thorium obtained for ferrocolumbium production.

Cases 3 and 4 would result in a permanent solution, but would be very expensive.

To obtain preliminary cost information, Lee Evans was consulted. Based on an assumption of 2000 cubic feet of contaminated material, the ballpark costs for Case 2 would be on the order of $100,000. Cases 3 and 4 both would be rough double this figure. The burial costs at Barnwell in Case 3 approximately equal the increased costs of transportation to Uravan for Case 4. Scrap such as railroad ties must go to Barnwell in any event. It must be emphasized that these values are dependent upon the volume to be relocated, which at present is unknown A program to delineate the surface areas and depths of contamination is necessary for a realistic estimate.

The deadline for cleanup is July 2, 1982, though I was informed by the state inspector that we can request an extention at that time. A statement of our decontamination plan will be appropriate with such a request.

D. R. Brosnahan
Radiation Safety Officer

DRB:jk

Attach.

OPTICAL EMISSION SPECTROGRAPHIC ANALYSES OF SAMPLES

FROM SELECTED AREAS SOUTH OF BLDG 166 - %*

	Al	B	Ba	Be	Ca	Cb	Ce	Co	Cr	Cu	Fe	Ga	Hf	La	Mg	Mn	Mo
Area 5, Surface	2.4	.024	.03	.0024	2.4	.6	.9	.03	2.4	.03	3	.03	.024	.24	2.4	.3	.024
Area 6, Surface	.6	.012	.024	.0024	.6	M	1.2	.012	.12	.006	6	-	.03	.24	.12	.24	-
Area 6, 6" Deep	3	.009	.006	.0012	.6	.6	-	.024	.9	.009	3	-	-	-	M	.12	-
Area 8, Surface	2.4	.03	.06	.0024	2.4	2.4	2.4	.06	.24	.03	3	.06	.03	.24	.6	6	.012

	Na	Ni	P	Pb	Sc	Si	Sn	Sr	Ta	Th	Ti	U	V	W	Y	Yb	Zr
Area 5, Surface	.24	.06	.06	.06	-	M	.6	.03	3	.24	.6	-	.06	.9	.06	-	.24
Area 6, Surface	-	.009	-	.3	.24	2.4	.9	.024	M	2.4	M	2.4	.024	.24	3	.24	.06
Area 6, 6" Deep	.12	.024	-	.09	.024	M	.6	-	M	.24	.6	-	.024	-	.6	.06	.03
Area 8, Surface	.3	.06	.24	.024	-	M	.6	.024	3	.3	.6	-	.06	2.4	.06	-	.6

* The following elements were looked for but not detected: - Ag, As, Au, Bi, Cd, Ge, Hg, In, Ir, Li, Os, Pd, Pt, Re, Rh, Ru, Sb, Te, Tl, Zn.

To include probable error, divide by three for lower limit, and multiply lower limit by ten for upper limit.

Dash indicates none detected; M indicates >10%.

X Pls F.J. Sibley
ew 10/28/81

OC
TJK
RJK
DJH
DRB

Elkem Metals Company
4625 Royal Avenue, P O Box 1344
Niagara Falls, New York 14302
☎ (716) 286-7400

October 27, 1981

Mr. Stephen G. Moorhead
Sullivan & Worcester
200 Park Avenue
New York, NY 10166

Dear Mr. Moorhead:

You requested our comment on the following items mentioned in your letter of October 22, 1981.

Chain Link Fence

The fence has been erected. A small section is down at the moment, to satisfy a Linde maintenance project. Mr. Temple assures me this will be replaced.

Contrary to your parenthetical note, we, at Niagara, assume that the fence belongs to Union Carbide Corporation. Please let us know if we are mistaken.

Frame Garage

It has been demolished.

Building 163 and Surrounding Area

Mr. Brosnahan's letter of October 13 summarizes the current status. Messrs. C. R. Allenbach (Elkem) and D. J. Hansen (UCC) are cooperating on this item. We foresee no problem, but will have to await the final survey.

Building 169 (Asbestos Pilot Plant)

Our Dr. Allenbach sees no problem in this area and we believe it is time to sign off. Mr. Temple's note of July 24, 1981, and attached memo cover the situation.

Very truly yours,

W. Chynoweth
Manager - Administration
and Technical Services

WC:cjb
Attachment

CC: E. W. Kantz
J. G. Oxaal
F. T. Temple

cc to C.R.A. - 10-23

OCT 23 1981

SULLIVAN & WORCESTER
200 PARK AVENUE
NEW YORK, NEW YORK 10166
(212) 599-7910
TELECOPIER NO. 212-599-7922
TWX: 710-581-0322

IN BOSTON, MASSACHUSETTS
100 FEDERAL STREET
BOSTON, MASSACHUSETTS 02110
(617) 338-2800
TELECOPIER NO. 617-338-2880
TWX: 710-321-1976

IN WASHINGTON, D. C.
1025 CONNECTICUT AVENUE, N. W.
WASHINGTON, D. C. 20036
(202) 293-6170
TELECOPIER NO. 202-293-2275

October 22, 1981

FEDERAL EXPRESS

Mr. William Chynoweth
Manager, Administration and
Technical Services
Elkem Metals Company Technical Center
4625 Royal Avenue
Niagara Falls, NY 14302

Dear Bill:

As we discussed on the telephone yesterday, I am enclosing a copy of the agreement signed on the closing date, covering Plant Operations at Niagara Falls.

As you can see from the agreement, Union Carbide has agreed that according to item Number 1 on Page 1, within 120 dyas, or October 31, Union Carbide will:

No. - UCC - ?

1) erect a chain link fence (which shall belong to you) along the common boundary between the Technology Center and your Niagara Plant, including any necessary gates for access to Buildings 88 and 99 and we shall both have keys for such gates; and,

Done

2) demolish a frame garage which extends from the south-easterly corner of the Technology Center onto your plant property.

Done

In addition, according to item Number 2 on Page 2 of the enclosed agreement, Union Carbide has agreed to take such actions, within a reasonable time after June 30, 1981, as may be necessary in order to decontaminate:

1) Building 163 and the area shown on Figure 2 attached to the enclosed letter agreement of such radiation as may be reasonably practicable in order to meet acceptable levels under applicable Federal standards; and,

one more survey - some work may be needed

2) Building 169 of asbestos in order to meet current Occupational Safety and Health Administration standards.

should be no problem

I would appreciate it if you would send me a letter, detailing Union Carbide's progress in fulfilling its obligations.

Sincerely,

Stephen G. Moorhead/ee

Stephen G. Moorhead

SGM/ee
Enclosure

cc: Harry W. Fawcett, Esq. (w/encl.)

UNION CARBIDE CORPORATION
270 PARK AVENUE, NEW YORK, N.Y. 10017

June 30, 1981

Elkem Metals Company
19th Floor
270 Park Avenue
New York, New York 10017

Re: Tiger Project - Plant Operations
Niagara Falls, New York

Gentlemen:

In conjunction with the closing of even date herewith as to the sale by Union Carbide Corporation ("Union Carbide") to Elkem Metals Company ("Elkem") of Union Carbide's alloys business and in particular the execution of a Lease Agreement (the "Lease Agreement") for the Niagara Falls Technology Center ("Technology Center"), Union Carbide and Elkem agree as follows:

1. Within 120 days after the date hereof, at its sole cost and expense, Union Carbide shall (i) erect a chain link fence (which shall belong to it) along the common boundary between the Technology Center and Union Carbide's Niagara Plant, including any necessary gates for access to Buildings 88 and 99; and (ii) demolish a frame garage which extends from the southeasterly corner of the Technology Center onto Union Carbide's plant property. Union Carbide and Elkem shall both have keys to such gates, which shall be maintained in a closed and locked position except when they are in active use. In the event that Union Carbide fails to maintain and repair said fence, upon ten (10) days' prior written notice to Union Carbide, Elkem shall have the right to make any necessary repairs thereto at its sole cost and expense, provided that it assumes all risks attendant with such work; except that if the requirement for repair arises solely out of the actions of Union Carbide, then Union Carbide shall reimburse Elkem the reasonable cost of any necessary repairs.

2. Within a reasonable period after the date hereof, at its sole cost and expense, Union Carbide shall take such actions as may be necessary in order to decontaminate (i) Building 163 and the area shown on Figure 2 attached hereto of such radiation as may be reasonably practicable in order to meet acceptable levels under applicable Federal standards; and (ii) Building 169 of asbestos in order to meet current Occupational Safety and Health Administration standards.

3. Union Carbide hereby grants to Elkem a non-exclusive easement of access to Building 88 over that part of 47th Street located within plant boundaries for as long as the the Lease Agreement of even date herewith shall remain in effect. Such easement shall be for the sole purpose of permitting deliveries and shipments as to nickel boron production and any other ferroalloy products produced in Building 88. Elkem shall indemnify and hold harmless Union Carbide from all claims, damages, loss and liability, including reasonable attorneys' fees, due to any personal injury, death or property damage (including without limitation any damage to the subject land and property of Union Carbide), arising out of Elkem's exercise of such easement rights, except where such claims, damages, loss and liability arise out of the gross negligence of Union Carbide. Elkem shall be liable for the cost of any repairs to Union Carbide's 47th Street roadway and adjoining paved surfaces due to Elkem's exercise of these easement rights. In the event Elkem exercises its option to purchase the Technology Center, simultaneously with the conveyance thereof, Union Carbide shall deliver to Elkem a permanent non-exclusive roadway easement incorporating provisions of this Paragraph 3 and in the same form (to the extent applicable) as Schedule G of the said Lease Agreement.

4. Union Carbide has assigned to Elkem certain sewage rights from the City of Niagara Falls (the "City") applicable to the Technology Center. The City has indicated that it is willing, subject to City Council approval, to increase the total allocation to Union Carbide's Niagara Plant (including the Technology Center) up to 125 pounds per day of suspended solids (SS) and 93 pounds per day of chemical oxygen demand (COD). In the event of any such increased allocation as to SS and COD, if Elkem does not receive 70% of any additional SS or COD rights, Union Carbide shall make a further assignment in order that Elkem will receive 70% of the total SS and COD allocated to the Technology Center and the Niagara Plant. Elkem reserves the right to make any claims or demands against Union Carbide as to the transferred sewage rights due to any infiltration or related problems affecting the Technology Center.

5. Anything to the contrary contained in the Lease Agreement notwithstanding, (i) if Union Carbide vacates any part of the Licensed Space at the Technology Center in order to accommodate the removal of Elkem personnel from Building 149, Elkem shall accept the surrender of such space and the Lease Agreement shall be modified accordingly; (ii) at the request of Elkem and subject to availability and Union Carbide's prior written consent, which shall not be unreasonably withheld, and consistent with past practices over the last five (5) years, Union Carbide shall deliver to Elkem additional electricity (hydroelectric power only), in excess of the limitations as set forth in Schedule C of the Lease Agreement, for Elkem's use at the Technology Center.

If the foregoing correctly sets forth the understanding and agreement of the parties, kindly execute this letter agreement in the space provided below.

Very truly yours,

UNION CARBIDE CORPORATION

By _____

Title _____

AGREED TO AND ACCEPTED:

ELKEM METALS COMPANY
By ELKEM INVEST, INC.
A General Partner

By _____

Title _____

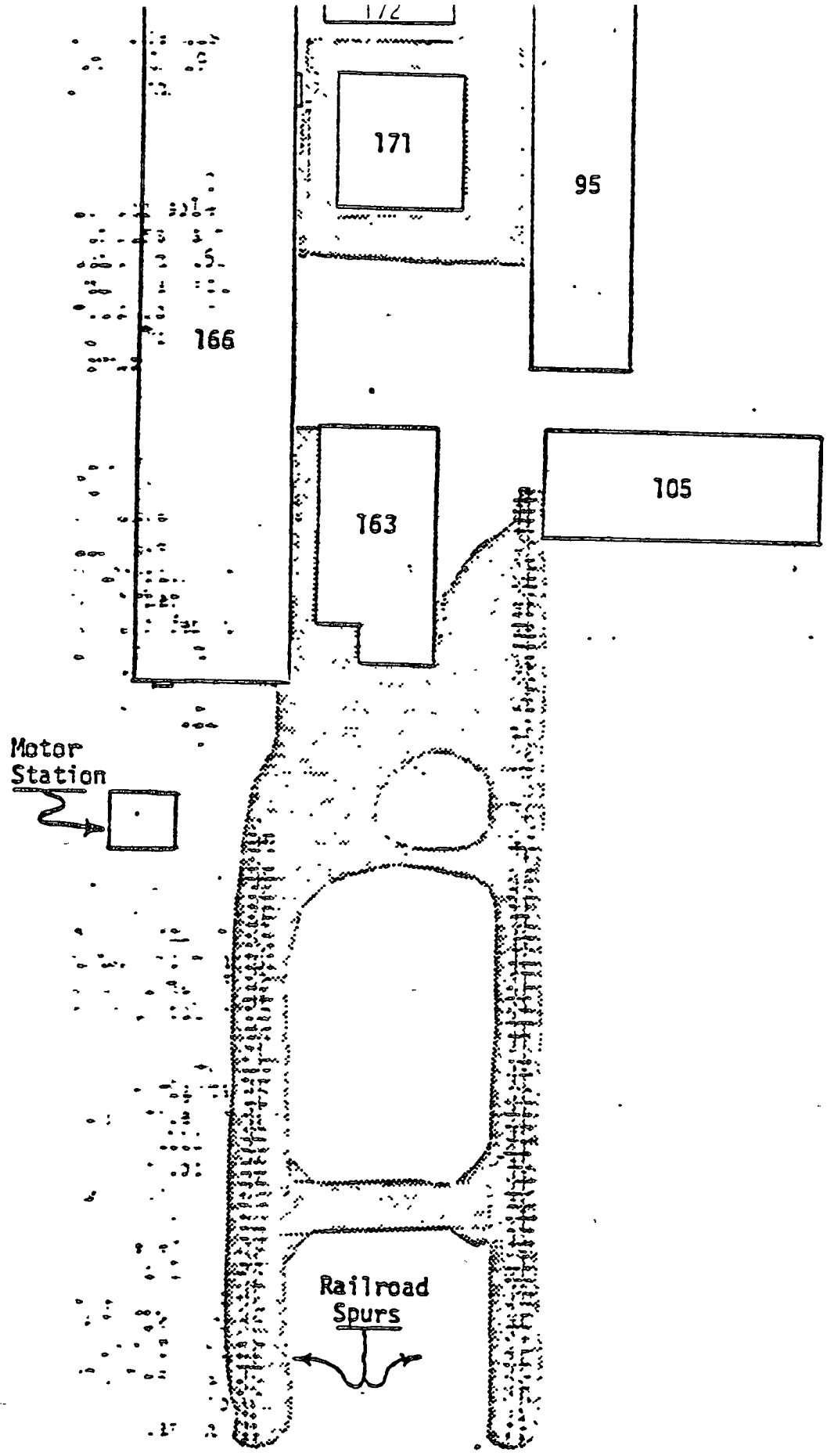

Fig. 2. Location of elevated surface gamma-ray levels (indicated by shading) in the Technology Area at UCC-MD, Niagara Falls, NY.

UNION CARBIDE

INTERNAL CORRESPONDENCE

C.R Allenbach

RECEIVED

OCT 1 0 1981

D. J. HANSEN

FILE

METALS DIVISION

P O BOX 579 - 4625 ROYAL AVE., NIAGARA FALLS, NEW YORK 1430.

o (Name) Dr.D. J. Hansen
ivision Building 94
ocation NIAGARA

Date October 13, 1981

Originating Dept. Minerals Technology

Answering letter date

Subject Radiation Survey of Technology Area

opy to Mr. H. J. O'Hear
Mr. R. G. Woolery

RECEIVED
OCT 14 1981
SHEA DEPT.

The attached figure shows the results of a radiation survey performed on October 5, 1981 along the east side of Building 166 to 95 building and the "ball field" behind 166. The values were obtained with a Geiger-Müller type survey meter manufactured by Victoreen of Cleveland, Ohio and are estimates of millirems per hour measured at 1" from the surface. It was observed during the survey that the map is not precisely to scale. As a result, the readings along 166 were taken relative to the location of the buildings, though they do approximate 50' centers. The readings within the railroad tracks are spaced ∿30' apart east to west and ∿50' apart north to south. The readings outside the tracks are ∿50' from the nearest reading just inside the tracks.

In general, levels exceeding background occur on all but the western side of Building 171, between Buildings 166 and 163, and along the railroad tracks. Most of these values are only marginally above background, and all those in the regular grid are less than the 0.25 mrem/hr limit for uncontrolled areas applicable to property that remains subject to the jurisdiction of the State Labor Law and Part 38 of the Industrial Code Rule, Ionizing Radiation Protection. (The 0.25 mrem/hr is from Table 5, attached, of Part 38, and is for fixed alpha or beta-gamma emitters. Also given is a value of 0.05%, or 500 ppm, for the limit of concentrations of source material in soil). However, a previously known area yielding higher emissions was reexamined and an estimated 4 mrem/hr was observed. The attached spectrographic analysis indicates that ∿2.4% of uranium and thorium exists at the surface of this area, and ∿.24% Th is detected at a depth of 6".

Based on the above information, the following is recommended:

1. Remove the surface material of >500 ppm U+Th and >.25 mrem/hr in the area of the ∿4 mrem/hr reading.

2. Survey the ball field area thoroughly as the ∿4 mrem/hr would not have been detected by obtaining readings at 30-50' intervals.

3. Analyze the material at the 0.13 mrem/hr areas to check that it does not contain >500 ppm U+Th.

DRB/rmm
Attachments

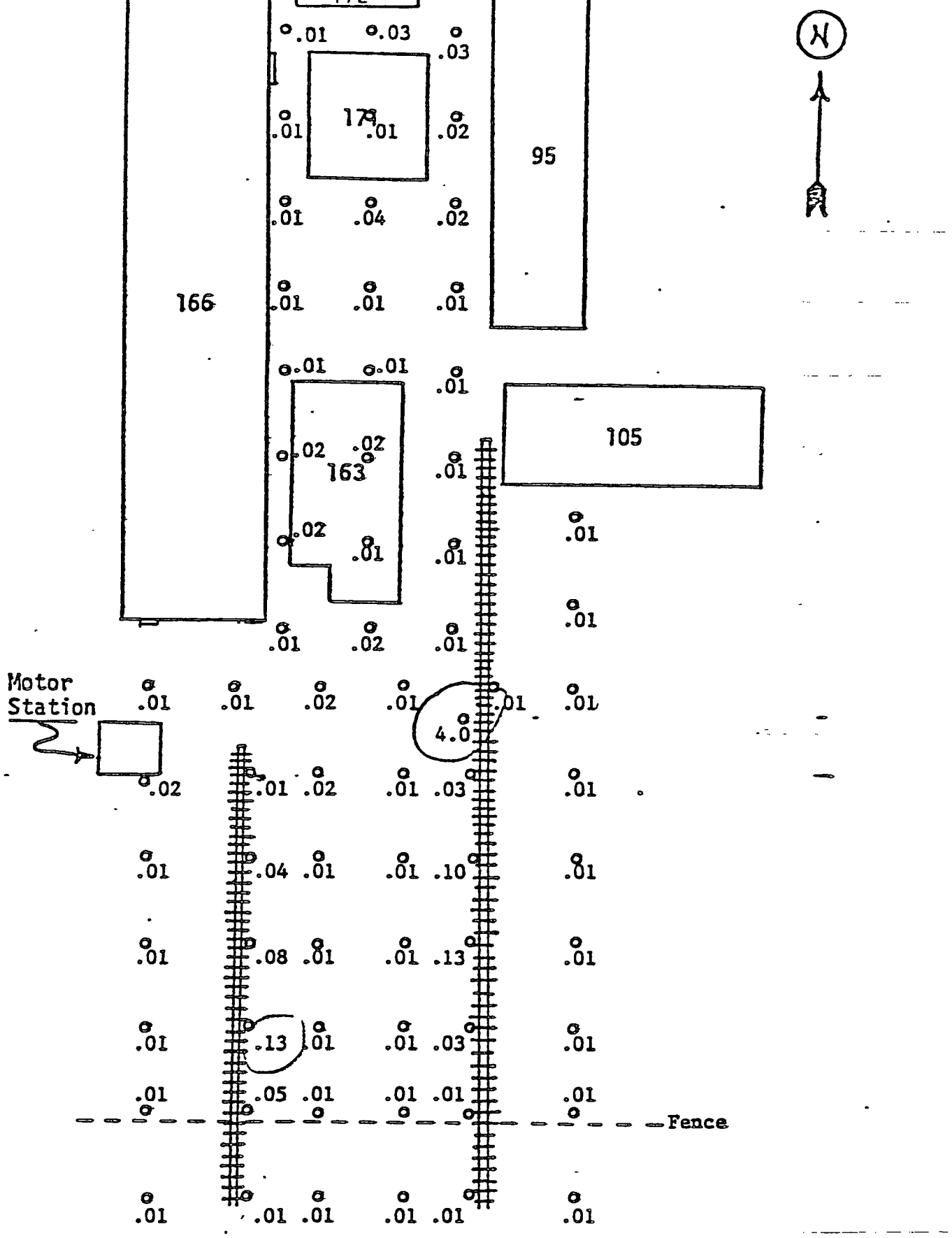

FIGURE 1. Radiation levels in mR/hr at the Technology Department noted during survey of 10/5/81. Natural background was ~.01 mR/hr.

ed)
E'S)

	Microcuries
.....	100
.....	100
.....	10
.....	10
.....	10
.....	10
.....	10
.....	10
.....	10
.....	100
.....	10
.....	1,000
.....	100
.....	100
.....	100
.....	10
.....	10
.....	10
.....	100
.....	100
.....	10
.....	100
.....	1,000
.....	10
.....	10
.....	10
.....	0.1

ru[illegible]present more than one
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TABLE 5
LIMITS FOR UNCONTROLLED AREAS

(a) Surface contamination limits.

(1) Alpha emitters.

(i) Removable:

$\frac{15\ pCi}{100\ cm^2}$	=	$\frac{33\ dpm}{100\ cm^2}$	average over any one surface
$\frac{45\ pCi}{100\ cm^2}$	=	$\frac{100\ dpm}{100\ cm^2}$	maximum

(ii) Total (fixed):

$\frac{450\ pCi}{100\ cm^2}$	=	$\frac{1000\ dpm}{100\ cm^2}$	average over any one surface
$\frac{2250\ pCi}{100\ cm^2}$	=	$\frac{5000\ dpm}{100\ cm^2}$	maximum
$\frac{0.25\ mrem\ at\ 1\ cm}{hr}$			

(2) Beta-Gamma emitters.

(i) Removable: (all beta-gamma emitters except Hydrogen 3)

$\frac{100\ pCi}{100\ cm^2}$	average over any one surface
$\frac{500\ pCi}{100\ cm^2}$	maximum

Removable: (Hydrogen 3)

$\frac{1000\ pCi}{100\ cm^2}$	average over any one surface
$\frac{5000\ pCi}{100\ cm^2}$	maximum

(ii) Total (fixed): $\frac{0.25\ mrem}{hr}$ at 1 cm from surface.

(b) Concentrations in air and water: Table 6, Schedule II.

(c) Concentrations in soil and other materials except water:

(1) Radioactive material except source material: Table 2, Column 2.

(2) Source material: 0 05 per cent by weight.

Note: Jurisdictional limits. The limits listed in Table 5 of this Part (rule) shall apply to those installations and property that remain subject to the jurisdiction of the Labor Law and this Part (rule).

UCC METALS DIVISION
R&D DEPT. ANALYTICAL LABORATORY
REPORT OF SPECTROGRAPHIC ANALYSIS

Plate No. 5717
Date 9 Sept 80
By Sluc

Submitted by W.R. Pioli
Ohynowetz, C.R. Allenbach
A.R. Brosnaker

Values in %

On Sample Basis
SEP 9 1980

$37-70

Sample No.	009433	009434			
Material	8610 @ # 1 Surface	8611 @ # 2 Edge			
Ag	—	—			
Al	.2-2.	1-10			
As	—	—			
Au	—	—			
B	.004-.04	.003-.03			
Ba	.008-.08	.002-.02			
Be	.0008-.008	.0004-.004			
Bi	—	—			
Ca	.2-2.	.2-2.			
Cb	M	.2-2.			
Cd	—	—			
Co	.004-.04	.008-.08			
Cr	.04-.4	.3-3.			
Cu	.002-.02	.003-.03			
Fe	2-20	1-10			
Ga	—	—			
Ge	—	—			
[illegible]	.01-.1	—			
In	—	—			
Ir	—	—			
Mg	.04-.4	M			
Mn	.08-.8	.04-.4			
Mo	—	—			
Na	—	.04-.4			
Ni	.003-.03	.008-.08			
Os	—	—			
P	—	—			
Pb	.1-1.	.03-.3			
Pd	—	—			
Pt	—	—			
Rh	—	—			
Sb	—	—			
Si	.8-8.	M			
Sn	.3-3.	.2-2.			
Sr	.008-.08	—			
Ta	M	M			
Th	.8-8.	.08-.8			
Ti	M	.2-2.			
Tl	—	—			
U	.8-8.	—			
V	.008-.08	.008-.08			
W	.08-.8	—			
Zn	—	—			
Zr	.02-.2	.01-.1			
Yttrium	1-10	.2-2.			
Ytterbium	.08-.8	.02-.2			
Lanthanum	.08-.8	—			
Scandium	[illegible]	[illegible]			

LGE 4/14/88

Niagara Cleanup.

1. Prepare Spec for cleanup.
   Option 3 Move to new property
   option 5 Remove & ship to repository

2. Option 3 –
   Need to resolve sale w/ Temple.
   Plant property may remain w/ new Powerhouse
   If no pad – plastic liner?

3. Option 5
   How is material shipped (box), bags?

4. Cleanup 5, 6
   Railroad track (ties) – removal / replacement
   Backfill Ferruginous vs Clean Fill
   Blacktop
   Fence

5. Review Plans w/ Temple Klotzbach
   Include Dubay Const on Bid List

TECHNOLOGY DEPARTMENT

REQUEST FOR SPECIAL ORDER

R&D	
Non-R&D	X

COPIES TJK
RJK

Dept. No.		Project Charge No.
520		20319

TITLE: SOIL DECONTAMINATION - SOUTH OF BLDG 166, NIAGARA

SPECIFIC OBJECTIVE: REMOVE CONTAMINATED SOIL & SHIP TO AN APPROVED REPOSITORY

$ 33,000 ENGINEERING

Estimated By: FRA

REQUESTED BY: L. EVANS Date 4/17/84

APPROVED BY: [signature] Date

Accounting Use Only

BUDGET CLASSIFICATION:

CHECKED BY: [signature] Date 4/17/84

INVOICE TO:

CLEAR TO:
84-615-885-10-150

DATE JOB CLOSED

UCCNHT0001724

LCE

Form RHA-P
(10/80)

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

SOUTH CAROLINA RADIOACTIVE WASTE TRANSPORT PERMIT

Pursuant to Act No. 429 of 1980, the South Carolina Radioactive Waste Transportation and Disposal Act, a Radioactive Waste Transport Permit is hereby issued to the below-named applicant (shipper). This permit shall not, in itself, be construed as authorizing a shipper to dispose of radioactive waste within the State of South Carolina. This permit shall not be transferred, assigned or in any manner disposed of, either voluntarily or involuntarily, directly, or indirectly, through transfer of control to any person, unless the Department shall, after securing full information, find the transfer is in accordance with the provisions of Act No. 429 and shall give written consent.

1. Name and Address of Applicant (Shipper):	2. Permit Number: 0211-31-84-X
Union Carbide Corporation Metals Division P.O. Box 97 Niagara Falls, New York 14302 (Marietta, Ohio)	3. Expiration Date: December 31, 1984

1984

For the South Carolina Department of Health and Environmental Control

April 23, 1984
Date of Issuance
DHEC 801 (10/80)

By Heyward G. Shealy
Heyward G. Shealy, Chief
Bureau of Radiological Health

LSE

UNION CARBIDE CORPORATION
METALS DIVISION
137 47TH STREET, P O BOX 97, NIAGARA FALLS, N Y 14302
TELEPHONE 716 278 3000
CABLE TWIX NO 710 524 1664

TECHNOLOGY DEPARTMENT
— ENGINEERING

April 6, 1984

Chem-Nuclear Systems, Inc.
P.O. Box 726
Barnwell, SC 29813

Attn: Mr. James Purvis
Director of Regulatory Affairs

Dear Mr. Purvis:

This letter authorizes Messrs. Earl Reagan, Anthony Chavis, or Doug McLean of NUS Process Services Corporation to act as our agent to obtain burial space at the Chem-Nuclear site in Barnwell, South Carolina.

If there are any questions regarding this matter, please contact Mr. L. G. Evans at Telephone No. (716) 278-3462 or Mrs. S. C. Zambotti at Telephone No. (716) 278-3232.

Sincerely,

S C Zambotti
Mrs. S. C. Zambotti
Purchasing Agent

SCZ/jl
cc: Earl Reagan
R. J. Klotzbach

AUTHORIZATION FOR OPERATING ACCOUNT DISBURSEMENT

Attach Original Documents
To be paid here _____

DATE April 9, 1984

Please Draw a Check in the Amount of $ 500.00

Payable to: S. Carolina Department of Health and Environmental Control, Bureau of Finance

Address: 2600 Bull Street
Columbia, S.C. 29201

In Payment of: Radioactive Waste Transportation Permit

Charge to: TaCb Relocation 740-885-1167-13
Marietta, Ohio

Requested by: L.G. Evans

Approved for Payment: R.J. Klotzbach

/XX/ Return CHECK to requisitioner for mailing.

/ / Mail to above address.

This file to be attached to voucher copy of check.
All individual items attached are to be stamped "PAID".

AUTHORIZATION FOR OPERATING ACCOUNT DISBURSEMENT

Attach Original Documents
To be paid here

DATE April 9, 1984

Please Draw a Check in the Amount of $ 500.00

Payable to: S. Carolina Department of Health and Environmental Control, Bureau of Finance

Address: 2600 Bull Street
Columbia, S.C. 29201

In Payment of: Radioactive Waste Transportation Permit

Charge to: TaCb Relocation 740-885-1167-13
Marietta, Ohio

Requested by: L.G. Evans

Approved for Payment: R.J. Klotzbach
R.J. Klotzbach

[XX] Return CHECK to requisitioner for mailing.

[ ] Mail to above address.

This file to be attached to voucher copy of check.
All individual items attached are to be stamped "PAID".

L. G Evans

UNION CARBIDE CORPORATION PO BOX 66, 137 - 47th STREET
METALS DIVISION NIAGARA FALLS, NEW YORK 14302

July 25, 1983

Chem-Nuclear Systems, Inc.
P.O. Box 726
Barnwell, SC 29813

Attn: Mr. James Purvis
Director of Regulatory Affairs

Dear Mr. Purvis:

EARL REAGAN

This letter authorizes Mssrs. Mike Anderson, Anthony Chavis, or Doug McLean of NUS Process Services Corporation to act as our agent to obtain burial space a the Chem-Nuclear site in Barnwell, South Carolina.

If there are any questions regarding this matter, please contact Mr. L.G. Evans at Telephone No. (716) 278-3462 or Mr. D.H. McGuire at Telephone No. (716) 278-3232.

MRS SC ZAMBOTTI

Sincerely,

D H McGuire

Mr. D.H. McGuire SC ZAMBOTTI
Purchasing Agent

DHM:db
cc: Mike Anderson, NUSPSC
EARL REAGAN
RJK

~~To: Betty Linville~~ From: L.G. Evans
Grand Junction

*This copy not approved
Please have original request approved
by R.J. Klotzbach & returned to me
Thanks -
Betty

n.f.
x 3462

AUTHORIZATION FOR OPERATING ACCOUNT DISBURSEMENT

Attach Original Documents
To be paid here

DATE April 9, 1984

Please Draw a Check in the Amount of $500.00 500.00

Payable to: S. Carolina Dept. of Health & Environmental Control, Bureau of Finance

Address: 2600 Bull Street
Columbia, SC 29201 29201

In Payment of: Radioactive Waste Transportation Permit

~~740~~ 02 885-0167-13

Charge to: TaCb Relocation 740-885-1167-13
Marietta, OH

Requested by: L. G. Evans

Approved for Payment: * R. Hagen

☒ Return CHECK to requisitioner for mailing.
☐ Mail to above address.

This file to be attached to voucher copy of check.
All individual items attached are to be stamped "PAID".

rec 4/9 lc 12:50p

UCCNHT0001730

UNION CARBIDE CORPORATION
METALS DIVISION
137 47TH STREET, P O BOX 97, NIAGARA FALLS, N Y 14302
TELEPHONE 716 278 3000
CABLE TWIX NO 710 524 1664

TECHNOLOGY DEPARTMENT
– ENGINEERING

April 6, 1984

Chem-Nuclear Systems, Inc.
P.O. Box 726
Barnwell, SC 29813

Attn: Mr. James Purvis
Director of Regulatory Affairs

Dear Mr. Purvis:

This letter authorizes Messrs. Earl Reagan, Anthony Chavis, or Doug McLean of NUS Process Services Corporation to act as our agent to obtain burial space at the Chem-Nuclear site in Barnwell, South Carolina.

If there are any questions regarding this matter, please contact Mr. L. G. Evans at Telephone No. (716) 278-3462 or Mrs. S. C. Zambotti at Telephone No. (716) 278-3232.

Sincerely,

S C Zambotti
Mrs. S. C. Zambotti
Purchasing Agent

SCZ/jl
cc: Earl Reagan
R. J. Klotzbach